352

PROPERTY OF
L. E. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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The PHOTOFACT Servicer

Vol. 36 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ March 15, 1957
Sets 351, 352

CORRECTION IN PHOTOFACT SET 342 - FOLDER 4.

The IRC replacement listing for the rear section of Craftsmen Part No. 23S727 should be M11-133 instead of Q11-133.

NEW PARTICIPANT

In future issues of Photofact Folders there will be a listing of replacement type batteries manufactured by the P. R. Mallory Co., Inc. of Indianapolis, Ind.

Their other product lines (Controls, Capacitors, Selenium Rectifiers, and Vibrators) will continue to be listed also.

LOOK For These NEW BOOKS On The SAMS Booktree At Your Local Parts Distributor :

CAT. NO.	TITLE
HFB-1	Hi-Fi Handbook
MRC-1	Metallic Rectifiers - Principles & Applications
CTB-9	Pin Point TV Troubles in Ten Minutes
AA-8	Audio Amplifier Manual
EFC-1	Learning Electricity Fundementals

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 310

General Electric Models 14T007, 14T008, 14T009, 14T010, 14T011 and 14T012 ("M" Line) were covered in Photofact Folder 4 - Set 310.

General Electric Models 14T016, 14T017 and 14T018 ("Q" Line) were covered in Production Change Bulletin 165 - Set 328-1.

The following production changes in the "Q" Line were made during late production. These changes cover all " Q" Line models mentioned above.

NEW TUNERS

Tuner part #RJX-095 or RJX-096 may be used in late production models. A schematic of the tuners, along with complete alignment procedure, is given in this bulletin.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

COMPONENT CHANGES

C28 is increased from 680MMF to 750MMF.

R80 is decreased from 82K to 75K.

C69 is increased from .0047MFD (paper) to .005MFD (ceramic).

C73 is increased from 260MMF to 500MMF.

C72 is omitted.

C26 is decreased from .2MFD to .1MFD.

C25 is a 62MMF feed-thru capacitor when tuner #RJX-095 or RJX-096 is used.

M1, selenium rectifier, is changed to a germanium rectifier (part #RER-027) with a 1000MMF @ 1000V ceramic capacitor wired in parallel.

RESISTOR-CAPACITOR COMBINATIONS

In some versions the following resistors and capacitors are combined in a single unit.

R50 and C51, part #RCR-003.

R49 and C49, part #RCR-001.

C4 and R7, part #RCR-002, with values of 500K and 470MMF.

LOCAL-DISTANT SWITCH

In later production M7, local-distant switch, and network, R10 and R11, are omitted. In extremely strong signal areas where attenuation is needed, the local-distant switch and network are available (part #REM-010).

"21Q"

On chassis stamped "21Q" the following production changes have been made.

COMPONENT CHANGES

R52 is increased from 15K to 47K.

R51 is decreased from 150K to 47K.

R59 is increased from 470K to 1Meg.

C52 is omitted.

R57 is omitted.

R5, height control, is decreased from 2Meg to 650K with a stop at 150K (part #RRC-421).

R55 is omitted.

R56 is omitted.

GENERAL ELECTRIC MODELS 14T016, 14T017, 14T018 ("Q" Line)

PRODUCTION CHANGES
BULLETIN 181

PRODUCTION CHANGES
BULLETIN 181

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ALIGNMENT INSTRUCTIONS

VHF OSCILLATOR ALIGNMENT FOR VHF TUNERS RJX-095 AND RJX-096

Check the alignment of the IF system before attempting tuner alignment.
Connect bias as under "Video IF Alignment".
Set the fine tuning approximately 10^{0} to 15^{0} from full clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 1	Across antenna terminals thru dummy antenna. (Fig. 1).	213MC (10MC Swp)	211. 25MC	13	Vert. amp. thru 10K to point (A). Low side to chassis. See Fig. 5 for location of point (A).	A41	Adjust to place video marker at 45% on high frequency side of curve as in Fig. 2. A42 thru A47 and A49 thru A52 are adjusted by compressing or expanding coil turns.
			207MC (10MC Swp)	205. 25MC	12		A42	
			201MC (10MC Swp)	199. 25MC	11		A43	
			195MC (10MC Swp)	193. 25MC	10		A44	
			189MC (10MC Swp)	187. 25MC	9		A45	
			183MC (10MC Swp)	181. 25MC	8		A46	
			177MC (10MC Swp)	175. 25MC	7		A47	
			85MC (10MC Swp)	83. 25MC	6		A48	
			79MC (10MC Swp)	77. 25MC	5		A49	
			69MC (10MC Swp)	67. 25MC	4		A50	
			63MC (10MC Swp)	61. 25MC	3		A51	
			57MC (10MC Swp)	55. 25MC	2		A52	

VHF RF AND MIXER ALIGNMENT FOR VHF TUNERS RJX-095 AND RJX-096

Remove the tuner cover and connect the negative lead of a 3 volt bias battery to the tuner AGC terminal. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Fig. 1	Across antenna terminals thru dummy antenna. (Fig. 1).	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point (G). Low side to chassis.	A53, A54, A55, A56, A57	Adjust for response similar to Fig. 3 with markers as indicated. Adjust gimmick (A53) for proper band width. Adjust A54 to correct video side of curve and A55 for sound side. Adjust A56 and A57 for maximum amplitude.
3.	"	"	207MC (10MC Swp)	205. 25MC 209. 75MC	12	"	A58, A59, A60	Adjust A58 for maximum gain and symmetry as in Fig. 3. Adjust A60 to correct video side of curve and A59 for sound side. Adjust by expanding or compressing coil turns.
4.	"	"	201MC (10MC Swp)	199. 25MC 203. 75MC	11	"	A61, A62, A63	Adjust A61 for maximum gain and symmetry as in Fig. 3. Adjust A63 for correct video side of curve and A62 for sound side. Adjust by expanding or compressing coil turns.
5.	"	"	195MC (10MC Swp)	193. 25MC 197. 75MC	10	"	A64, A65, A66	Adjust A64 for maximum gain and symmetry as in Fig. 3. Adjust A66 to correct video side of curve and A65 for sound side. Adjust by expanding or compressing coil turns.
6.	"	"	189MC (10MC Swp)	187. 25MC 191. 75MC	9	"	A67, A68, A69	Adjust A67 for maximum gain and symmetry as in Fig. 3. Adjust A69 to correct video side of curve and A68 for sound side. Adjust by expanding or compressing coil turns.
7.	"	"	183MC (10MC Swp)	181. 25MC 185. 75MC	8	"	A70, A71, A72	Adjust A70 for maximum gain and symmetry as in Fig. 3. Adjust A72 to correct video side of curve and A71 for sound side. Adjust by expanding or compressing coil turns.
8.	"	"	177MC (10MC Swp)	175. 25MC 179. 75MC	7	"	A73, A74, A75	Adjust A73 for maximum gain and symmetry as in Fig. 3. Adjust A75 to correct video side of curve and A74 for sound side. Adjust by expanding or compressing coil turns.

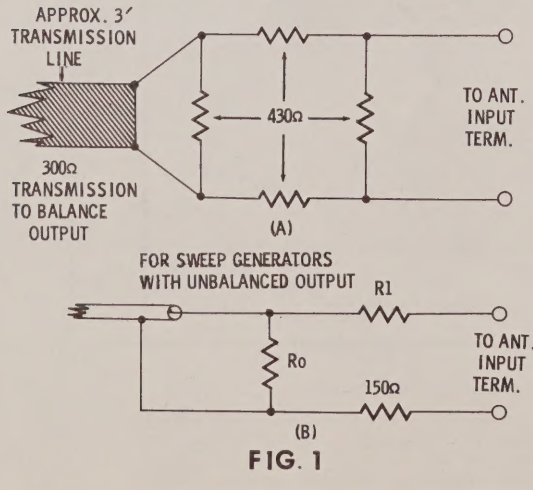


FIG. 1

Zo-SWEEPCABLE IMPEDANCE
Ro-TERMINATING IMPEDANCE

Zo	Ro	R1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
90Ω	110Ω	100Ω

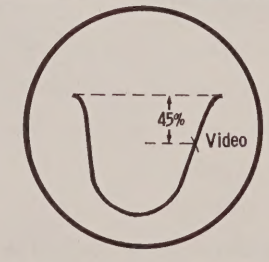


FIG. 2

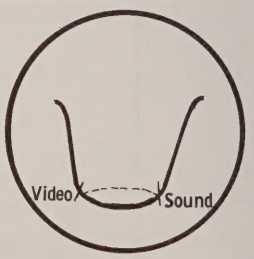


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A76, A77, A78	Adjust A76 for maximum gain and symmetry as in Fig. 4. Adjust A78 to correct video side of curve and A77 for sound side. Adjust by expanding or compressing coil turns.
10.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A79, A80, A81	Adjust A79 for maximum gain and symmetry as in Fig. 4. Adjust A81 to correct video side of curve and A80 for sound side. Adjust by expanding or compressing coil turns.
11.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A82, A83, A84	Adjust A82 for maximum gain and symmetry as in Fig. 4. Adjust A84 to correct video side of curve and A83 for sound side. Adjust by expanding or compressing coil turns.
12.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A85, A86, A87	Adjust A85 for maximum gain and symmetry as in Fig. 4. Adjust A87 to correct video side of curve and A86 for sound side. Adjust by expanding or compressing coil turns.
13.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A88, A89, A90	Adjust A88 for maximum gain and symmetry as in Fig. 4. Adjust A90 to correct video side of curve and A89 for sound side. Adjust by expanding or compressing coil turns.

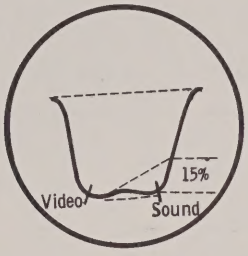


FIG. 4

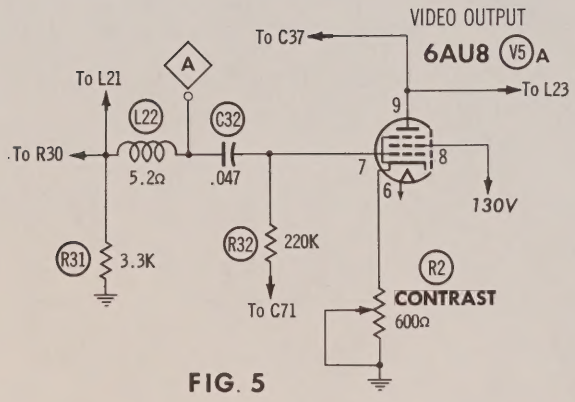
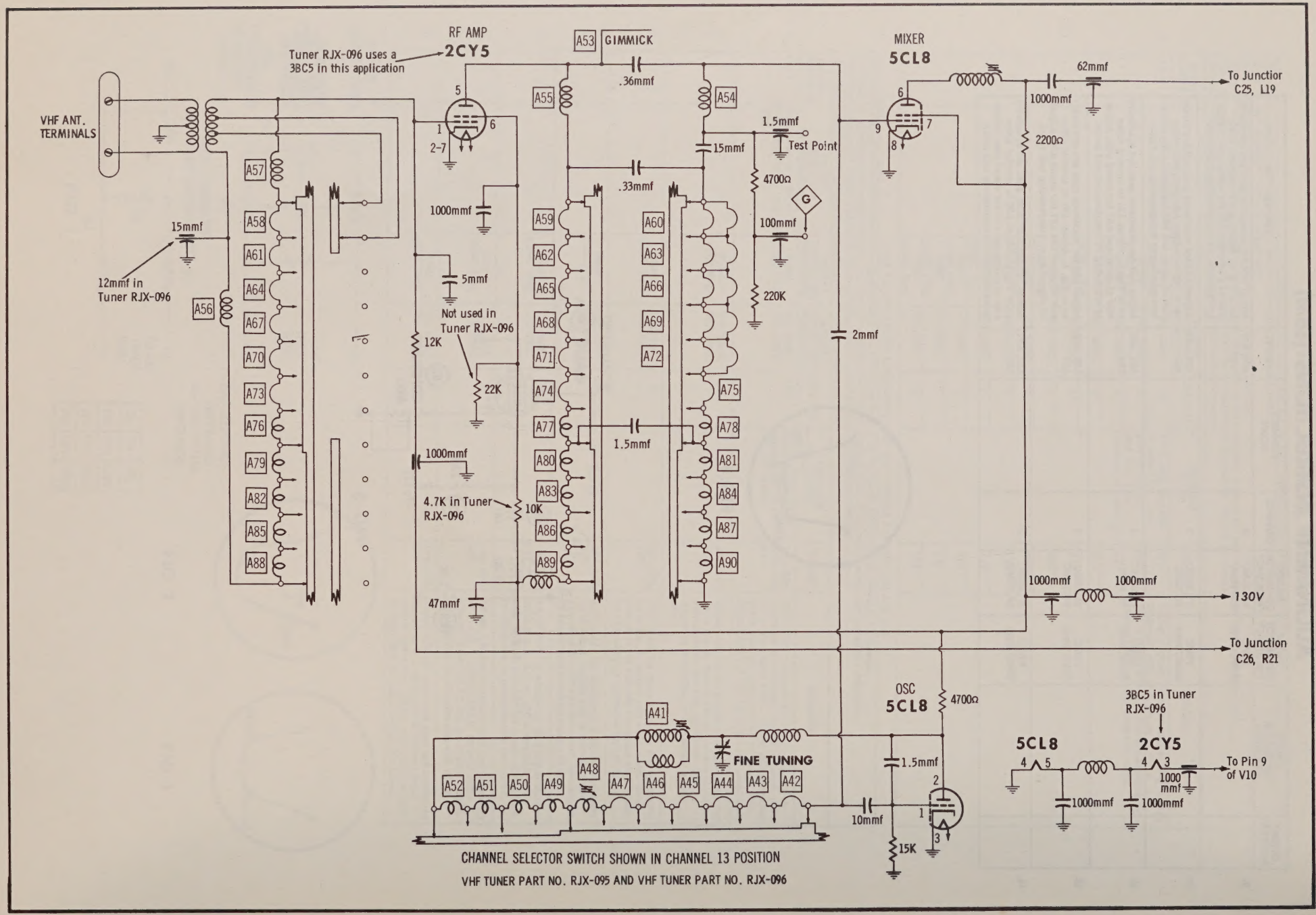


FIG. 5


RF AMP
2CY5
Tuner RJX-096 uses a 3BC5 in this application
A53 GIMMICK
.36mmf
MIXER
5CL8
62mmf
To Junction C25, L19
VHF ANT. TERMINALS
A55
A54
1.5mmf
Test Point
15mmf
1000mmf
2200Ω
.33mmf
4700Ω
G
100mmf
15mmf
12mmf in Tuner RJX-096
A57
A58
A61
A64
A67
A70
A73
A76
A79
A82
A85
A88
A56
A59
A62
A65
A68
A71
A74
A77
A80
A83
A86
A89
A60
A63
A66
A69
A72
A75
A78
A81
A84
A87
A90
5mmf
Not used in Tuner RJX-096
12K
22K
220K
2mmf
1000mmf
1.5mmf
4.7K in Tuner RJX-096
10K
47mmf
1000mmf
1000mmf
130V
To Junction C26, R21
OSC
5CL8
4700Ω
3BC5 in Tuner RJX-096
5CL8
2CY5
To Pin 9 of V10
A41
FINE TUNING
A52
A51
A50
A49
A48
A47
A46
A45
A44
A43
A42
1.5mmf
10mmf
15K
1000mmf
1000mmf
1000 mmf
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF TUNER PART NO. RJX-095 AND VHF TUNER PART NO. RJX-096

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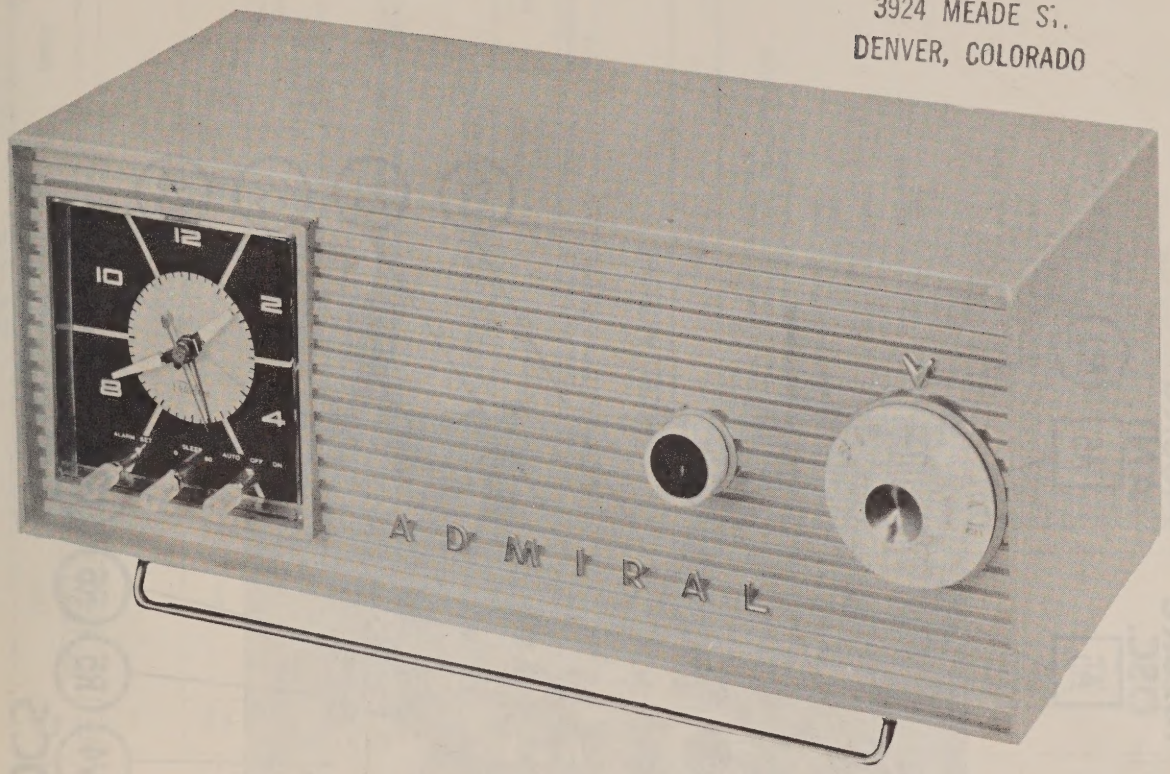

ADMIRAL
CHASSIS 5W3

TRADE NAME	Admiral, 5B42, 5B43, 5B48, 5H44, 5H47, 5H49, 5W32, 5W33, 5W34, 5W38, 5W39 (Ch. 5W3)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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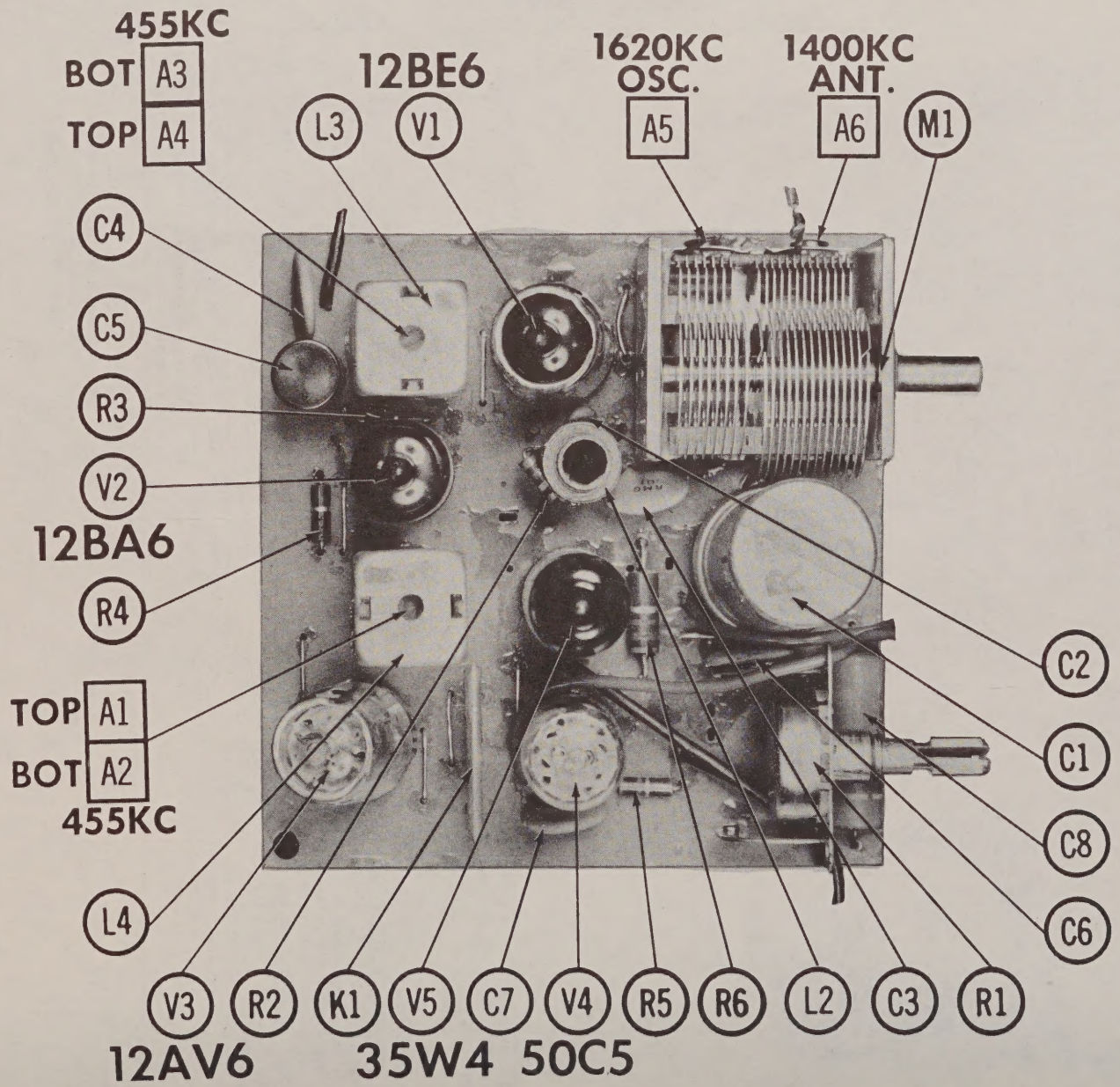


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■70	150	67C30-2		XBO181		TMD-16		TVL-2439
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	47		65D10-73	BPD-000047	DD-470	C10Q47C	ED-47	UC-5447	5GA-Q47	
C3	10000		65C10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4	10000		65C10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C5	.05	200	64A12-1	BPD-05	DF-503	BC2S47J		ACE6147	2SE-S47	
C6	10000		65C10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000		65C10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	.047	400	64B17-28	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	75C25-2					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K		60B8-223	BTS-22K	
R3	180Ω			BTS-180	Note 1
R4	2.2Meg		60B8-225	BTS-2.2Meg	
R5	150Ω		60B8-151	BTS-150	
R6	1200Ω	1	60B14-122	BTA-1200	

Note 1: 100Ω used in some versions. (Part #60B8-101)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Hallicrafters PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2300Ω	3-4Ω	Part of speaker 78B94-1	Z1101	A-3025	A-3332	26S58	S-12X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	78B94-1 ①	4A07	① Includes T1.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L1	Loop Ant.	69C205-3				Note 1
L2	Osc. Coil	69A190-4				Includes C2, R2.
L3	Input IF	72C28-65	16-6780	BC-356	13-PC1	
L4	Output IF	72C28-65	16-6780	BC-357	13-PC2	

Note 1: Includes cabinet back. Models 5H44, 5H47, 5H49.
Models 5W32, 5W33, 5W34, 5W38, 5W39 use part no. 69C 205-1.
Models 5B42, 5B43, 5B48 use part no. 69C205-3.
Part no. A5096 used in models with letter "N" included in model number. (Includes appliance outlet.)
Part no. A5095 used in models without letter "N" included in model number. (Includes appliance outlet & line cord.)

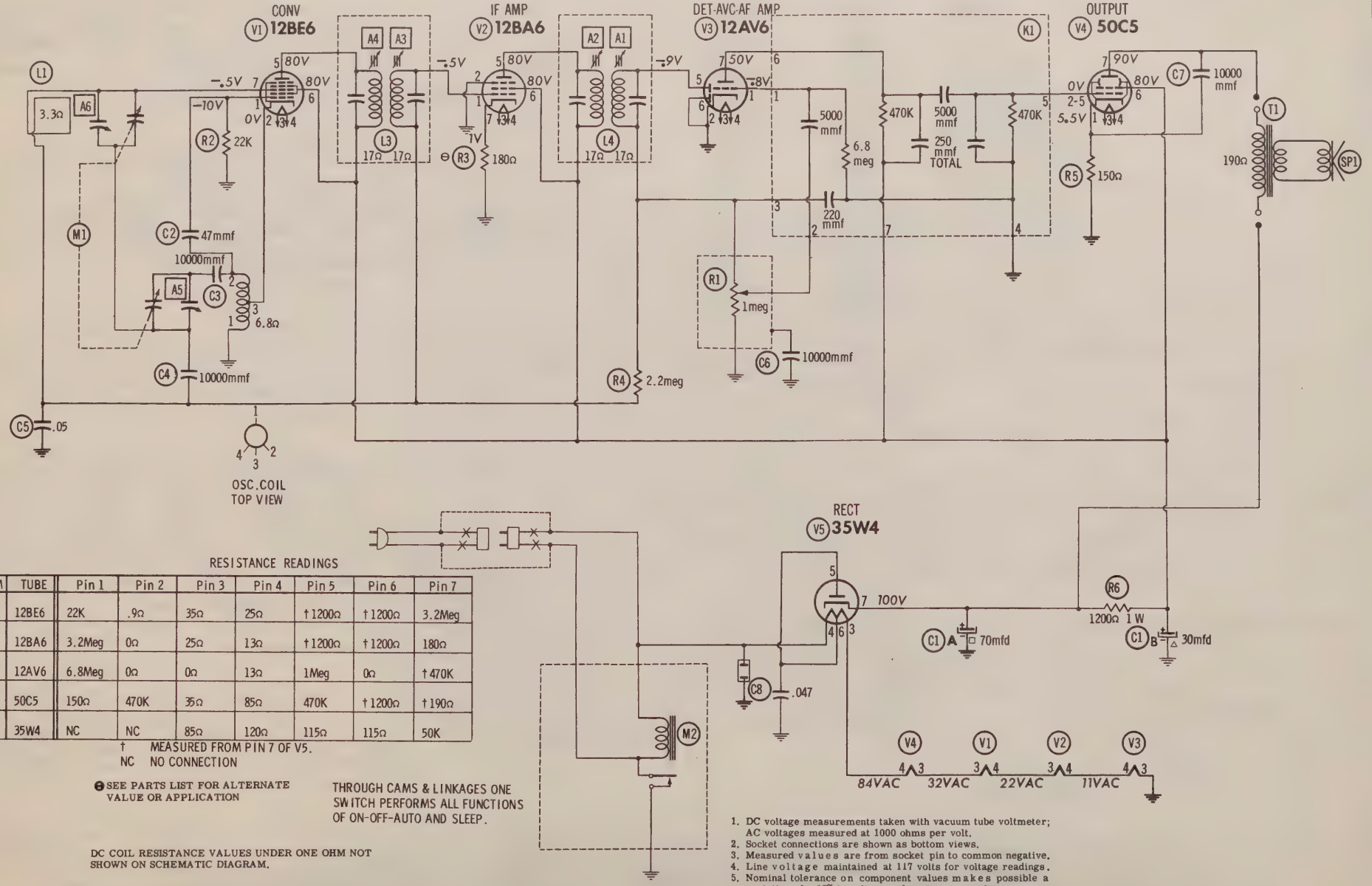
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA	
K1	Det. -Audio Net.	5000MMF, 5000MMF, 250MMF, 220MMF, 6.8Meg, 470K, 470K	63B6-14	Centralab	PC-156
				Erie	1408-02

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Cap.	68B64-1	Two Gang
M2	Clock	91C17-1	Used in models 5B42, 5B43, 5B48.
	Clock	91C15-1	Used in models 5W32, 5W33, 5W34, 5W38, 5W39.
	Clock	91C21-1	Used in models 5H44, 5H47, 5H49.
	Crystal	24A20	Clock
	Knob	33C154-6	Clock, Models 5W32, 5B42.
	Knob	33C154-9	Clock, Models 5W33, 5B43.
	Knob	33C154-12	Clock, Model 5W34.
	Knob	33C154-24	Clock, Models 5W38, 5B48.
	Knob	33C154-27	Clock, Model 5W39.
	Knob	33A200-1	Clock, Models 5H44, 5H47, 5H49.
	Knob	33C154-4	Tuning, Models 5W32, 5B42.
	Knob	33C154-7	Tuning, Models 5W33, 5B43.
	Knob	33C154-10	Tuning, Model 5W34.
	Knob	33C154-22	Tuning, Models 5W38, 5B48.
	Knob	33C154-25	Tuning, Model 5W39.
	Knob	33C197-3	Tuning, Models 5H44, 5H47, 5H49.
	Knob	33C154-5	Volume, Models 5W32, 5B42.
	Knob	33C154-8	Volume, Models 5W33, 5B43.
	Knob	33C154-11	Volume, Model 5W34.
	Knob	33C154-23	Volume, Models 5W38, 5B48.
	Knob	33C154-26	Volume, Model 5W39.
	Knob	33C197-2	Volume, Models 5H44, 5H47, 5H49
	Cabinet	34D87-2	Models 5W32, 5B42.
	Cabinet	34D87-3	Models 5W33, 5B43.
	Cabinet	34D87-4	Model 5W34.
	Cabinet	34D87-8	Models 5W38, 5B48.
	Cabinet	34D87-9	Model 5W39.
	Cabinet	34D87-11	Model 5H44.
	Cabinet	34D87-12	Model 5H47.
	Cabinet	34D87-13	Model 5H49.

ADMIRAL MODEL 5B42 (Ch. 5W3)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.9Ω	35Ω	25Ω	†1200Ω	†1200Ω	3.2Meg
V2	12BA6	3.2Meg	0Ω	25Ω	13Ω	†1200Ω	†1200Ω	180Ω
V3	12AV6	6.8Meg	0Ω	0Ω	13Ω	1Meg	0Ω	†470K
V4	50C5	150Ω	470K	35Ω	85Ω	470K	†1200Ω	†190Ω
V5	35W4	NC	NC	85Ω	120Ω	115Ω	115Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO AND SLEEP.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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*TRADE MARK

AMBASSADOR MODELS
17TT61E, M, 17TT62, 17TT63 (Ch. A2005)

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AMBASSADOR MODEL 17TT61M (Ch. A2005)

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Ambassador, Models 17TT61E, M, 17TT62, 17TT63 (Ch. A2005)
SUPPLIER	Allied Pur. Corp., 401 Fifth Avenue, New York 16, N. Y.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC ~ 60 Cycles — RATING: 117 Watts (1 Amp. @ 117 Volts AC)
TUNING RANGE	Channels 2 thru 13VHF, Video IF 45. 75MC, Sound IF 41. 25MC (Intercarrier)

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Tube Placement Chart (Top View) 5

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DATE 3-57 SET 352 FOLDER 3

AMBASSADOR MODELS
17TT61E, M, 17TT62, 17TT63 (Ch. A2005)

RETMA MEMBER

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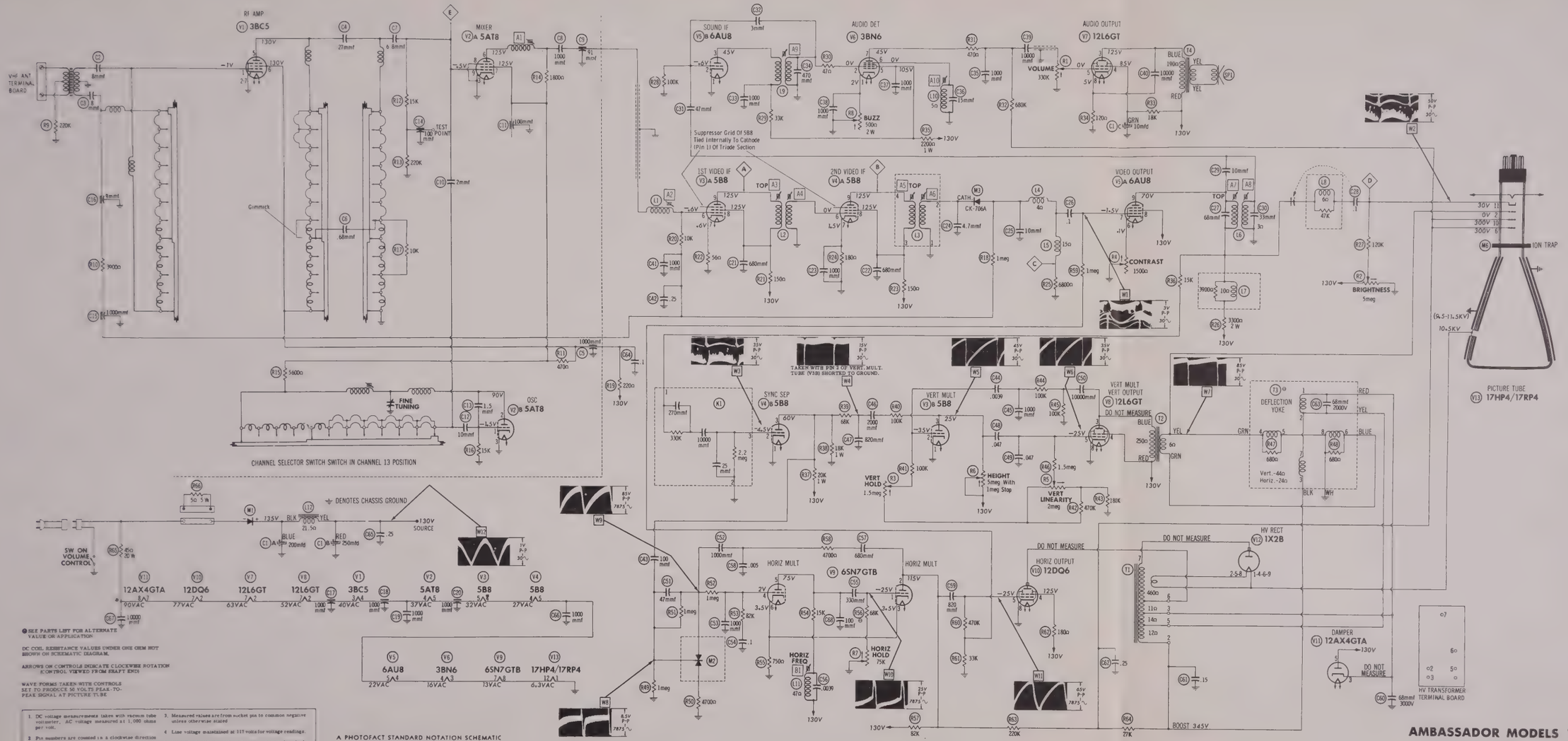
CORRECTION NOTICE

The following schematic diagram should be filed in Set 352-3 to replace incorrect diagram.

AMBASSADOR MODELS
17TT61E, M, 17TT62, 17TT63 (Ch. A2005)


RF AMP
V1 3BC5
MIXER
V2A 5AT8
SOUND IF
V5B 6AU8
AUDIO DET
V6 3BN6
AUDIO OUTPUT
V7 12L6GT
1ST VIDEO IF
V3A 5B8
2ND VIDEO IF
V4A 5B8
VIDEO OUTPUT
V5A 6AU8
SYNC SEP
V4B 5B8
VERT MULT
V3B 5B8
VERT MULT VERT OUTPUT
V8 12L6GT
HORIZ MULT
V9 6SN7GTB
HORIZ OUTPUT
V10 12DQ6
HV RECT
V12 1X2B
DAMPER
V11 12AX4GTA
PICTURE TUBE
V13 17HP4/17RP4
OSC
V2B 5AT8
VHF ANT TERMINAL BOARD
Gimmick
TEST POINT
FINE TUNING
CHANNEL SELECTOR SWITCH SWITCH IN CHANNEL 13 POSITION
Suppressor Grid Of 5B8 Tied Internally To Cathode (Pin 1) Of Triode Section
BUZZ 500Ω 2W
VOLUME 330K
CONTRAST 1500Ω
BRIGHTNESS 5meg
HEIGHT 5meg With 1meg Stop
VERT LINEARITY 2meg
VERT HOLD 1.5meg
HORIZ HOLD 75K
HORIZ FREQ
DEFLECTION YOKE
Vert.-44Ω
Horiz.-24Ω
ION TRAP
(9.5-11.5KV)
10.5KV
DO NOT MEASURE
BOOST 345V
HV TRANSFORMER TERMINAL BOARD
TAKEN WITH PIN 2 OF VERT. MULT. TUBE (V3B) SHORTED TO GROUND.
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
12AX4GTA 12DQ6 12L6GT 12L6GT 3BC5 5AT8 5B8 5B8
90VAC 77VAC 63VAC 52VAC 40VAC 37VAC 32VAC 27VAC
6AU8 3BN6 6SN7GTB 17HP4/17RP4
22VAC 16VAC 13VAC 6.3VAC
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs.
2. Remove 2 wood screws, remove rear cover.
3. Remove 5 wood screws holding front panel of bottom and remove HV lead.
4. Remove speaker leads, picture tube socket, Ion trap, centering device.
5. Remove 2 wood screws, remove antenna terminal assembly.
6. Remove 1 wood screw holding top chassis brace.
7. Remove 2 chassis bolts, remove chassis.
8. Remove 2 speaker nuts, remove speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

MODEL	CHASSIS
17TT61M	A2005

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding strip at bottom of safety glass. Using extreme caution, remove strip and remove safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENT

Focus

Adjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator, remove the rear cover and supply power to the set. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R8) for maximum volume and MINIMUM buzz.

FUSES

A 5Ω fusible resistor (R66) is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

AMBASSADOR MODELS
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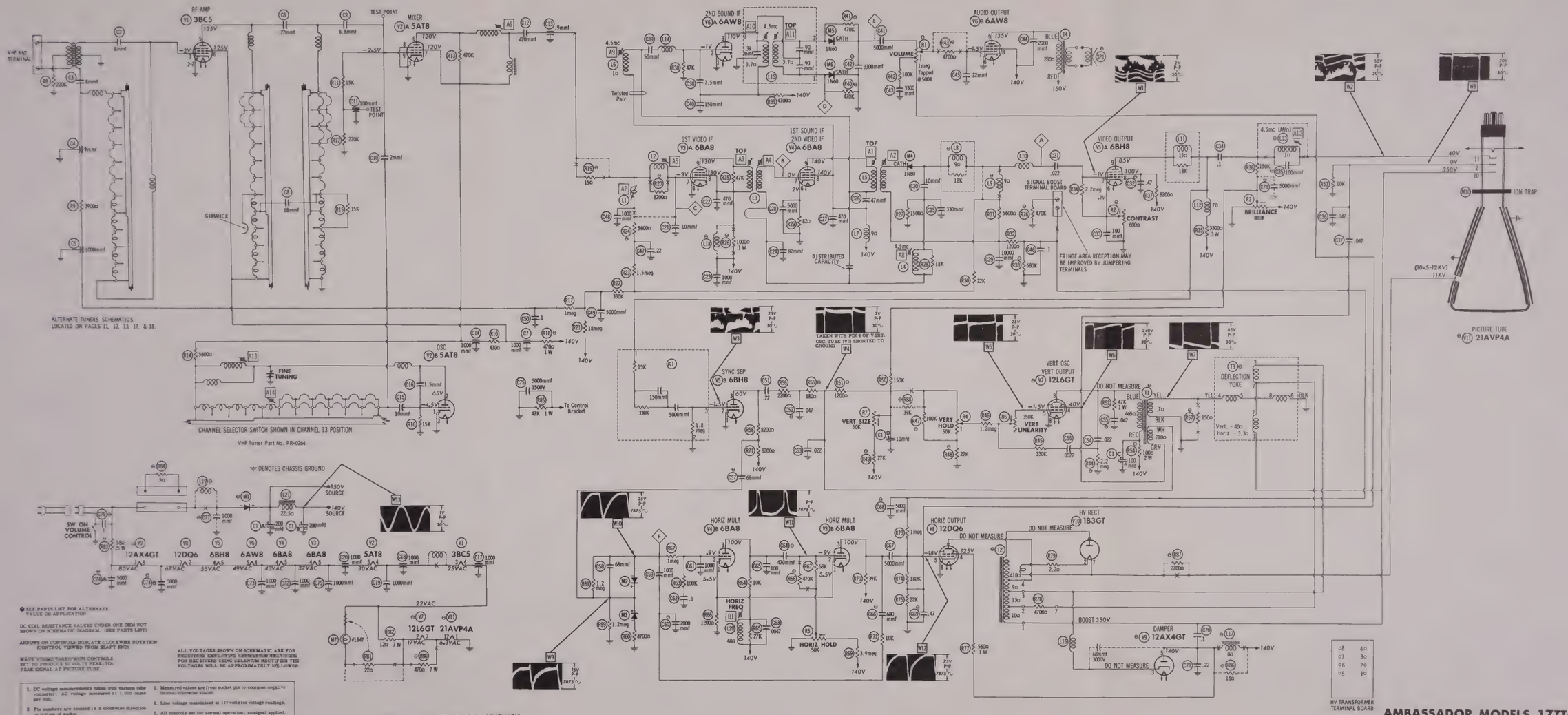

AMBASSADOR MODELS 17TT61E, M, 17TT62, 17TT63 (Ch. A2005)

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

ALL VOLTAGES SHOWN ON SCHEMATIC ARE FOR RECEIVERS EMPLOYING SELENIUM RECTIFIER. FOR RECEIVERS USING SILICON RECTIFIER THE VOLTAGES WILL BE APPROXIMATELY 10% LOWER.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative (chassis) terminal.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

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AMBASSADOR MODELS 17TT61E, M, 17TT62, 17TT63 (Ch. A2005)

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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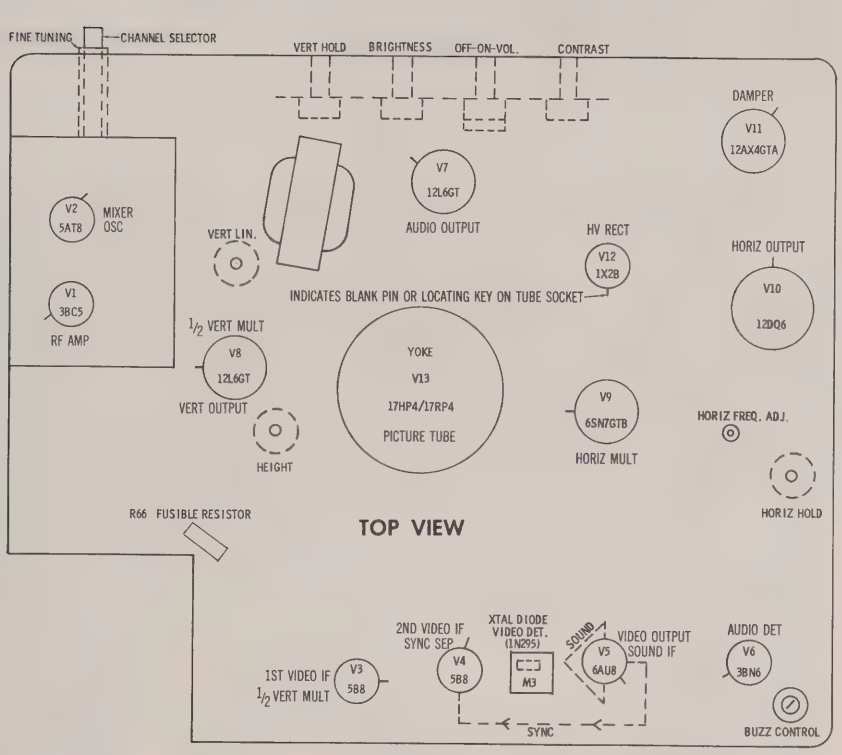


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

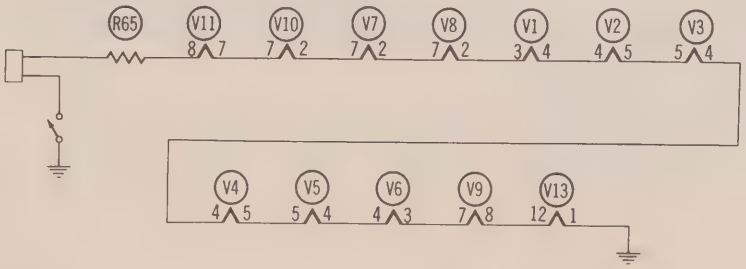
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R66), Rectifier (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M3), V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V5, V13
Has pic, no sound - V5, V6, V7

SYNC FAILURE
No vert. sync - V4, V5, V8
No horiz. sync - V4, Diode (M2), V9
No vert. or horiz. sync - V4

SWEEP FAILURE
No raster, has sound - M2, V9, V10, V11, V12, V13
No vertical deflection - V3, V8
Poor vert. linearity or foldover - V3, V8
Poor horiz. linearity or foldover - V9, V10, V11
Narrow picture - V9, V10, V11, M1
Vert. off freq. - V4, V5, V8
Horiz. off freq. - V4, M2, V9

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



SET 352 FOLDER 3

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to the ungrounded side of C42. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube.	44.25MC (10MC Swp)	42.75MC 45.75MC	Any unused channel.	Vert. amp. thru detector (Fig. 1) to point Ⓐ. Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 2 with markers properly positioned.
2.	1000MMF	High side to pin 6 (grid) of 5B8 (V3). Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to point Ⓑ. Low side to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point Ⓔ. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed to obtain response curve on scope similar to Fig. 3.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set volume control for normal volume.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 9 (plate) of 6AU8 (V5). Low side to chassis.	Not Used.	4.5MC (400∿ 30% AM Mod.)	Any unused channel.	Across secondary at audio output trans.	A10	Set buzz control (R8) 90° from its maximum clockwise rotation. Adjust A10 for maximum 400∿ indication on scope.
6.	"	"	"	"	"	"	A7, A8, A9	Attenuate generator output so that signal level is below limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A7, A8 and A9 for maximum 400∿ indication on scope.
7.	"	"	"	"	"	"	R8	Use high signal generator output and adjust buzz control (R8) for MINIMUM 400∿ indication on scope.
8.	"	"	4.5MC (7.5KC Swp)	4.5MC	"	"	A10	With volume control at low level, retouch A10 for maximum scope indication with marker at center of response peak. Retouch A7 and A8 for maximum response.

TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

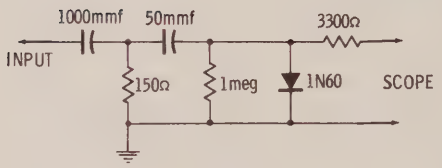


FIG. 1

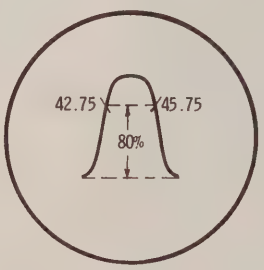


FIG. 2

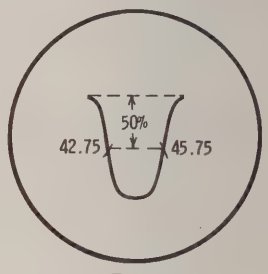
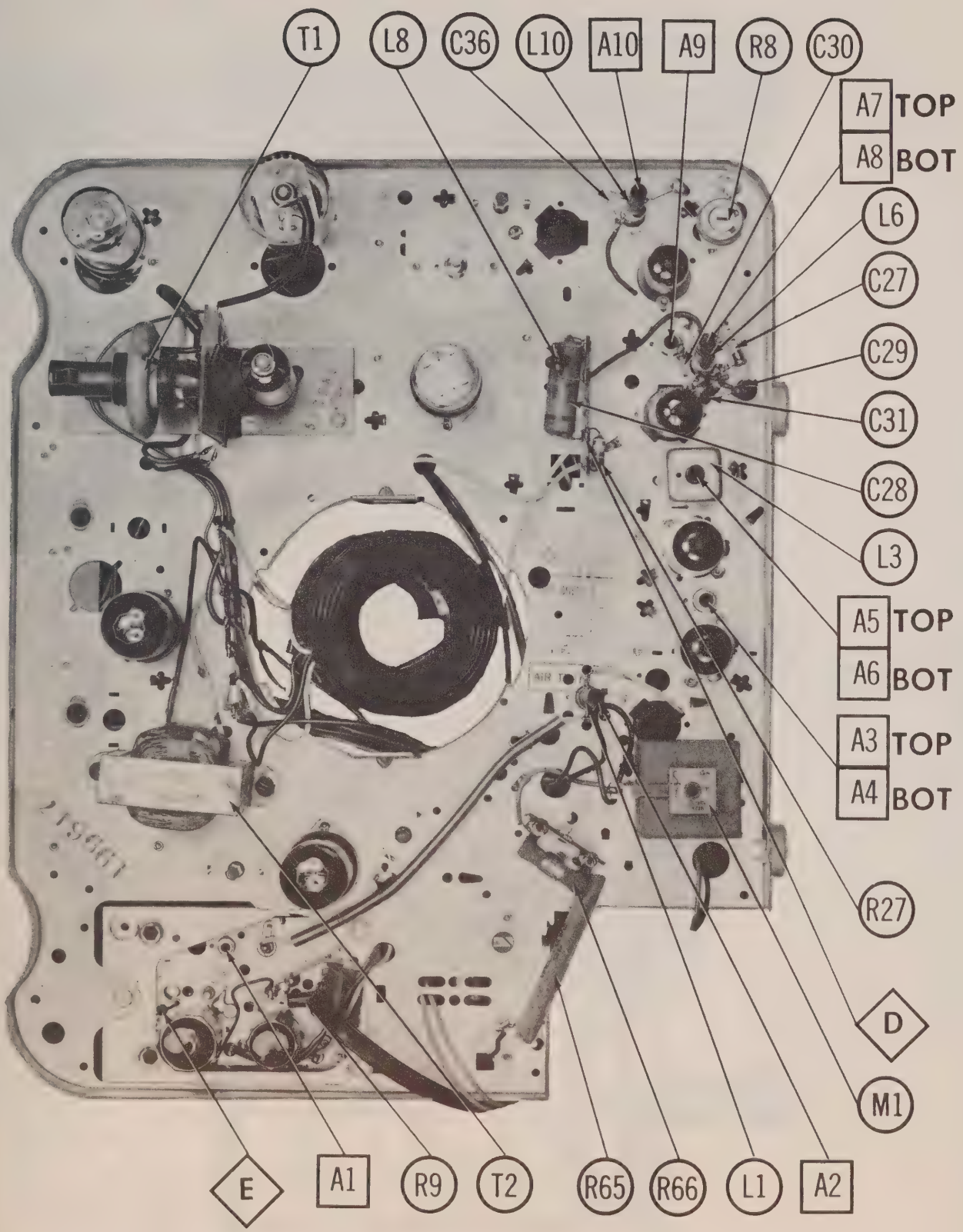
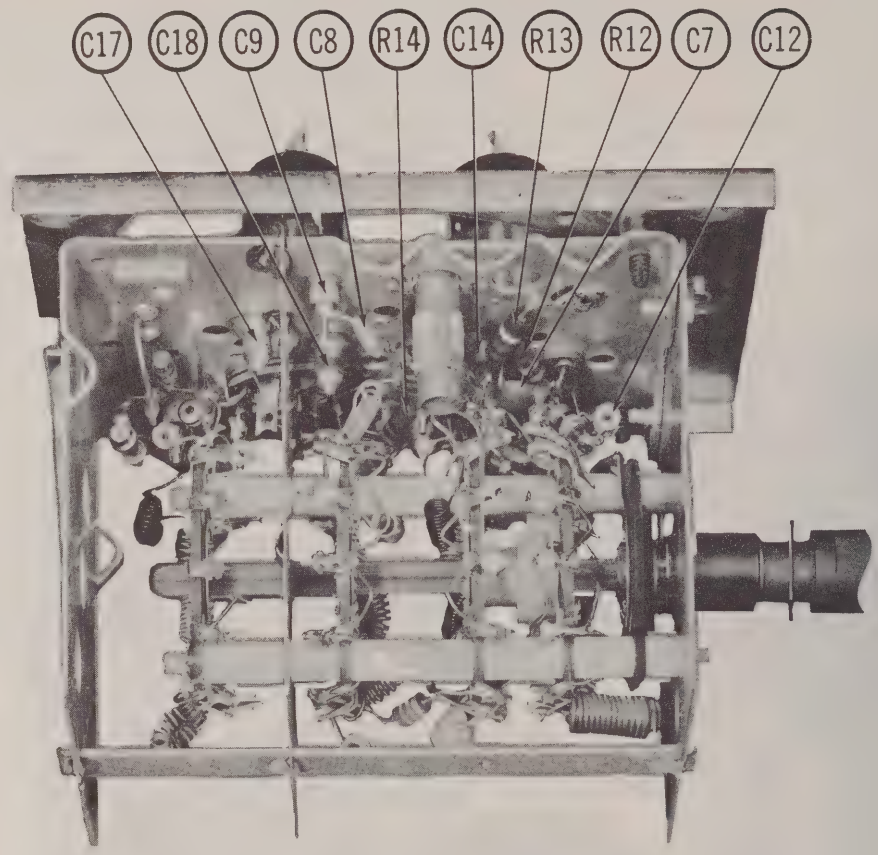


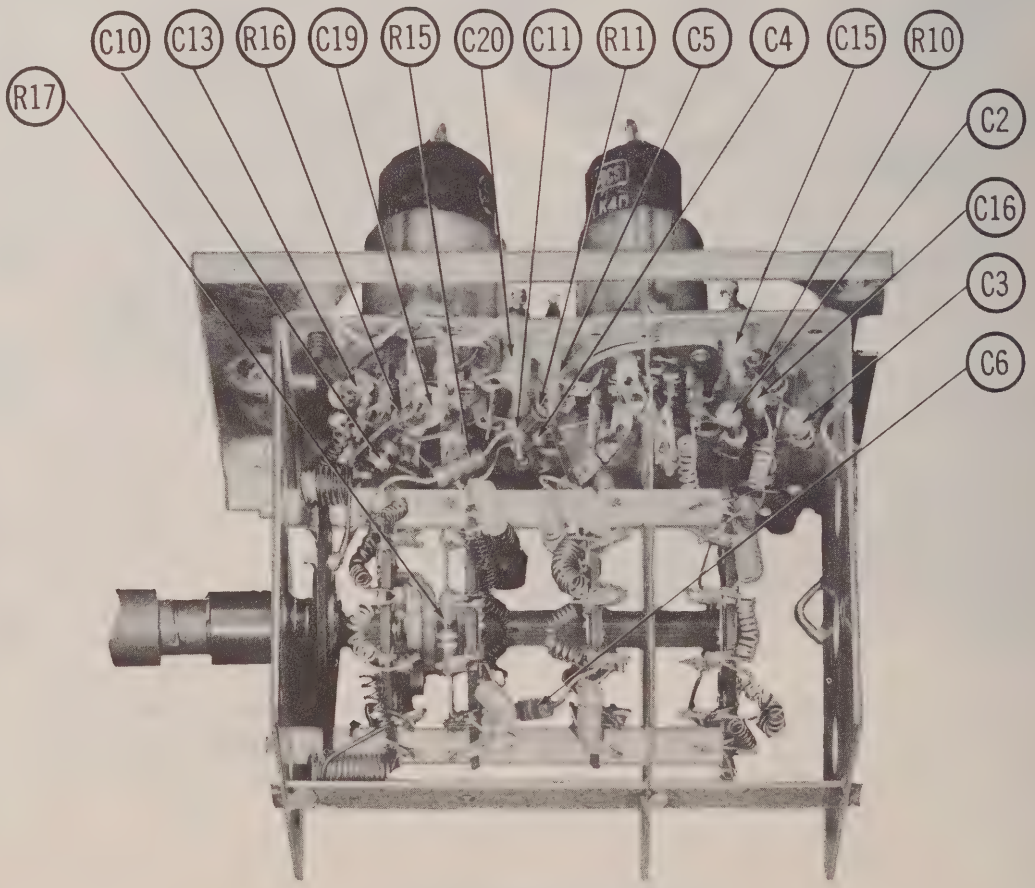
FIG. 3



CHASSIS TOP VIEW



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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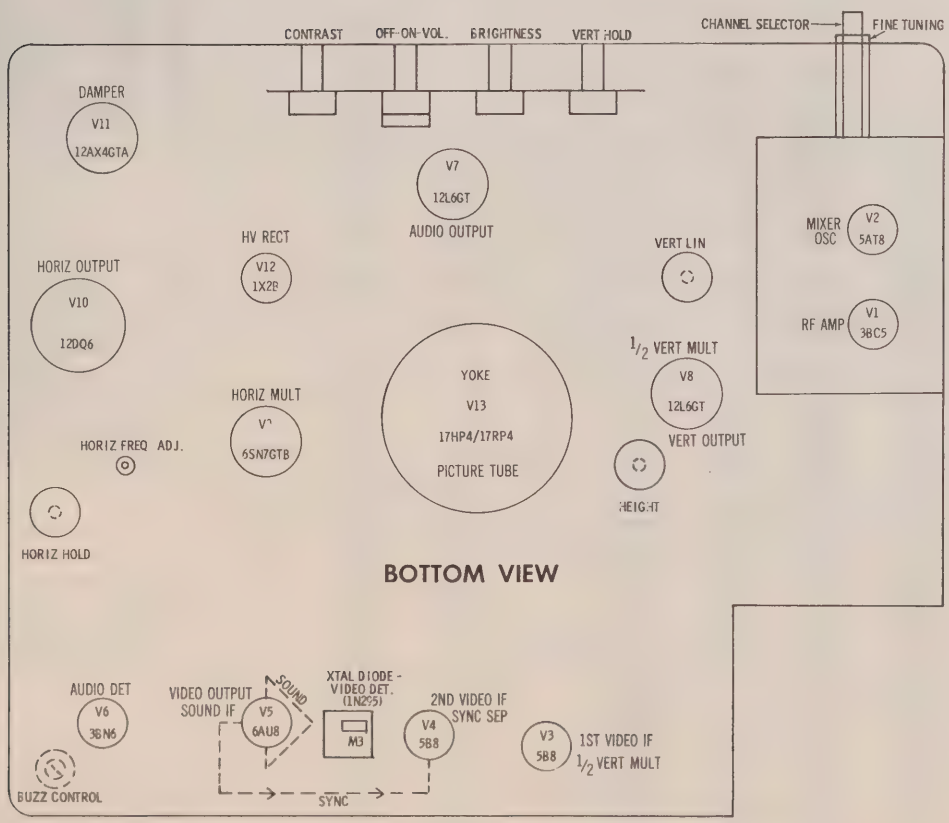
DENVER, COLORADO

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	10Ω	11Ω	†240Ω	†240Ω	0Ω		
V2	5AT8	15K	†6000Ω	0Ω	10Ω	9Ω	†2500Ω	†700Ω	0Ω	235K
V3	5B8	0Ω	●1Meg	●†1Meg	7.5Ω	9Ω	1Meg	56Ω	†150Ω	†150Ω
V4	5B8	0Ω	2.2Meg	†20K	7.5Ω	6Ω	.1Ω	180Ω	†150Ω	†150Ω
V5	6AU8	0Ω	100K	†35K	4Ω	6Ω	●30Ω	1Meg	†22Ω	†3300Ω
V6	3BN6	●180Ω	47Ω	3Ω	4Ω	†2200Ω	5Ω	†900K		
V7	12L6GT	NC	13.5Ω	†210Ω	†18K	●230K	NC	16Ω	120Ω	
V8	12L6GT	TP	11Ω	†270Ω	†20Ω	● 2.2Meg	TP	13.5Ω	0Ω	
V9	6SN7GTB	●100K	†82K	750Ω	2Meg	†15K	750Ω	3Ω	1.5Ω	
V10	12DQ6	TP	16Ω	TP	†180Ω	500K	TP	18Ω	0Ω	TOP CAP ‡11Ω
V11	12AX4GTA	NC	NC	INF	NC	†20Ω	NC	22Ω	18Ω	
V12	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡471Ω
V13	17HP4	0Ω	13Ω	*27K	‡27K	● 400K	1.5Ω			

† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM PIN 3 OF V11.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

SET 352 FOLDER 3

AMBASSADOR MODELS 17TT61E, M, 17TT62, 17TT63 (Ch. A2005)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer-Osc.	5AT8	
V3	1st Video IF Amp. - Vert. Mult.	5B8	
V4	2nd Video IF Amp. - Sync Sep.	5B8	
V5	Video Output - Sound IF Amp.	6AU8	
V6	Audio Detector	3BN6	
V7	Audio Output	12L6GT	
V8	Vert. Mult. - Vert. Output	12L6GT	
V9	Horiz. Mult.	6SN7GTB	
V10	Horiz. Output	12DQ6	
V11	Damper	12AX4GTA	
V12	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	AMBASSADOR PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V13	17RP4/ 17RP4	17RP4/ 17RP4	17RP4/17RP4	17RP4/ 17RP4	① Aluminized ② Silver Screen "85"
		17RP4B ①	17RP4A 17RP4B ①	17RP4B ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	AMBASSADOR PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	45-355	PR3-012		WT320	CDB-T-1015	D-095 MT-1510	R2213*
B	250	150							
C	10	150							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AMBASSADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	8			NPO-S18. 2		C10V8C	TCO-8. 2			
C3	8			NPO-S18. 2		C10V8C	TCO-8. 2			
C4	. 27									
C5	1000			EF-001	MFT-1000				503C-D1	
C6	. 68				TCZ-R68		TCO-. 68	ZT-5675		
C7	6. 8			NPO-S6. 8	TCZ-6. 8	C10V68C	TCO-6. 8	ZT-5568		
C8	1000		47A230	BPD-001	DD-103	BYA6D1	ED-1000	DC521	5HK-D1	
C9	91									
C10	2			NPO-S12. 2	TCZ-2R2	C10V2C	TCO-2. 2			
C11	100			EF-0001	MFT-100				503C-T1	
C12	10			NPO-S1 10	TCZ-10	C10D1C	TCO-10	ZT-541	5TCC-Q1	
C13	L 5									
C14	100			EF-0001	MFT-100				503C-T1	
C15	1000			EF-001	MFT-1000				503C-D1	
C16	9									
C17	1000			EF-001	MFT-1000				503C-D1	
C18	1000			EF-001	MFT-1000				503C-D1	
C19	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C20	1000			EF-001	MFT-1000				503C-D1	
C21	680		47A632	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C22	680		47A632	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C23	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C24	4. 7		47B403-6	NPO-S14. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	
C25	10		47CA10A100K	N750-S1 10	TCN-10	CTA6Q1U	TC7-10	NT-541	5TCU-Q1	
C26	. 1	150	46A343	P1508SM-1	DF-104	CUB150P1		GEM-15001	150TM-P1	
C27	68		47B479							
C28	. 1	200	46AU104J	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C29	10		47A150-11	BPD-00001	DD-100	C10Q1C	ED-10	UC-541	5GA-Q1	
C30	33		47B478	N080-S1 10						
C31	47		47CA30A470M	BPD-000047	DD-470	C10Q47C	ED-47	UC-5447	5GA-Q47	
C32	3		47A307	NPO-S13		C10V3C	TCO-3	ZT-553		
C33	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C34	470			1468-00047		5WST47			MS-347	
C35	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C36	15		47B480	N750-S1 15	TCN-15	CTA6Q15U	TC7-15		5TCU-Q15	
C37	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C38	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C39	10000		47A234	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C40	10000		47A234	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C41	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C42	. 25	200	46AT254S	P288N-25		CUB2P25		GEM-2025	2TM-P25	
C43	100		47CA30A101M	N750-S1 100	TCN-100	CTA6T1U	TC7-100	NT-551	5TCU-T1	
C44	. 0039	400	46BR392E4	BPD-004	DD-402	CUB4D39		GEM-4239	4TM-D39	
C45	1000		47-503	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C46	2000		47A395	BPD-002	DD-202	BYA6D2	GP-2000	DC522	5HK-D2	
C47	820		47-808	BPD-0008	D6-821	BYA10T82	ED-820	UC-5382	5GA-T82	
C48	. 047	400	46AW473E	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C49	. 047	400	46AW473E	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C50	10000		47-605	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C51	47		47CA40A470M	BPD-000047	DD-470	C10Q47C	ED-47	UC-5447	5GA-Q47	
C52	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C53	1000		47A586	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C54	. 1	150	46A343	P1508SM-1	DF-104	CUB150P1		GEM-15001	150TM-P1	
C55	330	500	47X20D331K	1468-00033		5WST33			MS-333	
C56	. 0039	400	46BR392E4	BPD-004	DD-402	CUB4D39		GEM-4239	4TM-D39	
C57	680		47X20D681K	1467-00068		5WST68			MS-368	
C58	. 005	200	46AU502E	BPD-005	DD-502	CUB2D5		GEM-225	2TM-D5	
C59	820		47-806	BPD-0008	D6-821	BYA10T82	ED-820	UC-5382	5GA-T82	
C60	68	3000	47B473	HVD-30-68	DD30-680	HVB30Q68		DC30468	30GA-Q68	
C61	. 15	600	46AX154J	P688N-15		CUB6P15		GEM-6015	6TM-P15	
C62	. 25	600	46AX254J	P688N-25		CUB6P25		GEM-6025	6TM-P25	
C63	68	2000	47-439	HVD-30-68	DD30-680	HVB20Q68		DC30468	20GA-Q68	Note 1
C64	. 1	200	46AU104J	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C65	. 25	200	46AT254J	P288N-25		CUB2P25		GEM-2025	2TM-P25	
C66	1000		47A230	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C67	10000		47A234	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C68	100	500	47X30B101K	1467-0001		5WST1			MS-31	

Note 1 A 47mmf may be used in this application in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AMBASSADOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	330K	½	25B1101	B-60-S	A47-500K-Z	Q13-132	TA334A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	
R2A	5Meg	½	25B1254			Q17-141	TA56R	Brightness
B	Shaft					Not Req.	Not Req.	
R3A	1. 5Meg	½	25B1256	AB-742	A47-L5Meg-S	Q11-138	TA155L	Vert. Hold
B	Shaft			AK-3	FS-3	Not Req.	Not Req.	
R4A	1500Ω	½	25B1102	AB-515		Q17-109	U-5	Contrast
B	Shaft			AK-3		Not Req.	Not Req.	
R5A	2Meg	½	25B1255	AB-75	A47-2Meg-S	Q11-139	PTA25L	Vert. Linearity
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R6A	5Meg	½	25B1098	*AB-86	*A47-4Meg-S	*Q11-141	*PTA355L	Height With 1Meg Stop.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R7A	75K	½	25B1305	AB-35	A47-75K-S	Q11-125	PTA15L	Horiz. Hold
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R8	500Ω	2	25A1095		39-500		FL-500	Buzz (Wire-wound)

* Connect a 1Meg resistor in series with the right hand terminal of the control as viewed from shaft end, terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AMBASSADOR PART No.	IRC PART No.	
R9	220K		23X20X224K	BTS-220K	
R10	3900Ω			BTS-3900	
R11	470Ω		23X20X471K	BTS-470	
R12	15K		23X20X153K	BTS-15K	
R13	220K		23X20X224K	BTS-220K	
R14	1800Ω			BTS-1800	
R15	5600Ω			BTS-5600	
R16	15K		23X20X153K	BTS-15K	
R17	10K		23X20X103K	BTS-10K	
R18	1Meg		23X20X105K	BTS-1Meg	
R19	220Ω		23X20X221K	BTS-220	
R20	10K		23X20X103K		
R21	150Ω		23X20X151K	BTS-150	
R22	56Ω		23X20X560K	BTS-56	
R23	150Ω		23X20X151K	BTS-150	
R24	180Ω		23X20X181K	BTS-180	
R25	6800Ω		23X20X682K	BTS-680	
R26	3300Ω	2	23X40X332K	BTB-3300	
R27	120K		23X20X124K	BTS-120K	
R28	100K		23X20X104K	BTS-100K	
R29	33K		23X20X333K	BTS-33K	
R30	47Ω		23X20X470K	BTS-47	
R31	470Ω		23X20X471K	BTS-470	
R32	680K		23X20X684K	BTS-680K	
R33	18K		23X20X183K	BTS-18K	
R34	120Ω		23X20X121K	BTS-120	
R35	2200Ω	1	23X30X222K	BTA-3200	
R36	15K		23X20X153K	BTS-15K	
R37	20K 5%	1		BTA-20K 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AMBASSADOR PART No.	IRC PART No.	
R38	18K	1	23X30X183K	BTA-18K	
R39	68K		23X20X683K	BTS-68K	
R40	100K		23X20X104K	BTS-100K	
R41	100K		23X20X104K	BTS-100K	
R42	470K		23X20X474K	BTS-470K	
R43	180K		23X20X184K	BTS-180K	
R44	100K		23X20X104K	BTS-100K	
R45	100K		23X20X104K	BTS-100K	
R46	L. 5Meg		23X20X155K	BTS-L. 5Meg	
R47	680Ω		23X20X681K		
R48	680Ω		23X20X681K		
R49	1Meg		23X20X105K		
R50	4700Ω		23X20X472K		
R51	1Meg		23X20X105K		
R52	1Meg		23X20X105K		
R53	82K		23X20X823K		
R54	15K		23X20X153K		
R55	750Ω 5%		23X20X751J		
R56	68K		23X20X683K		Note 1
R57	82K		23X20X823K		
R58	4700Ω		23X20X472K		
R59	1Meg		23X20X105K		
R60	470K		23X20X474K		
R61	33K		23X20X333K		
R62	180Ω		23X20X181K	BTS-180	
R63	220K		23X20X224K	BTS-220K	
R64	27K		23X20X273K	BTS-27K	
R65	45Ω	20	24B1048	2D-50	
R66	5Ω	5	24-1073	FR5. 6	

Note 1: A 82K resistor is used in some versions.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		AMBASSADOR PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No	Thordarson PART No	Triad PART No.
T1	Horiz. Output Trans.	55D285							
T2	Vert. Output Trans.	55C284	Z1900 ①	A-2823②		V307 ②	A-8113	26S72 ②	A-108X ②
T3A	Yoke(70°)Horiz(30MH)	53C377	DF605④⑤	MDF-73④	222D①④⑤	Y70F20/43 ④⑤	DY-11A④⑤	Y-10 ③	Y-19-1④
B	Vert(42. 5MH)	53-377 ③							

① Use 7 to 1 turns ratio.
② Drill new mounting hole(s).
③ Alternate Meteor part number.
④ Use original yoke damping network if necessary.
⑤ Connect capacitor C63 across horiz. yoke terms #1 and #2.
⑥ Remove capacitor from horiz. yoke terms.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AMBASSADOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	2350Ω	3-4Ω	55C292 ①	Z1101	A-3025	A-3332	26S58 ②	S-12X	① Alternate part #55-248. ② Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AMBASSADOR PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	85C175A	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AMBASSADOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st Video IF	51-2104		TV-131	6225	
L2	2nd Video IF	51-2105				
L3	3rd Video IF	50-[illegible]				
L4	RF Choke	53A307	19-1005		4624	16 Microhenries
L5	Shunt Peaking Coil	51-2102	19-3660		6148	710 Microhenries
L6A	4. 5MC Trap	51B-1996				
B	1st Sound IF				6134▲	395 Microhenries; Wound on 3900Ω resistor.
L7	Shunt Peaking Coil	51-2101	19-4400▲			
L8	Series Peaking Coil	51-2100	19-3180*	TV-184*	6180*	165 Microhenries; Wound on 47K resistor.
L9	2nd Sound IF	51-2103				
L10	Quadrature Coil	51A1857			1480	

▲ Parallel with 3900Ω resistor.
* Parallel with 47K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AMBASSADOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No	Thordarson PART No.	
L11	47Ω		51B2109	19-1576		6210			HS-5	17-42 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	AMBASSADOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No.	
L12	. 230A	21. 5Ω	. 5HY	56B224	C5040	C-2994	C-2327	28C41	C-23X	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AMBASSADOR PART No.	REPLACEMENT DATA	
K1	Sync Couplate	270MMF, 10000MMF, 25MMF, 330K, 2. 2Meg	49A046	Aerovox Centralab Sprague	PA533 PC263 8T-3

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	AMBASSADOR PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	. 230A	27A218	1090A	RS300SL	6S300	6Q4	300	

SELENIUM DIODE

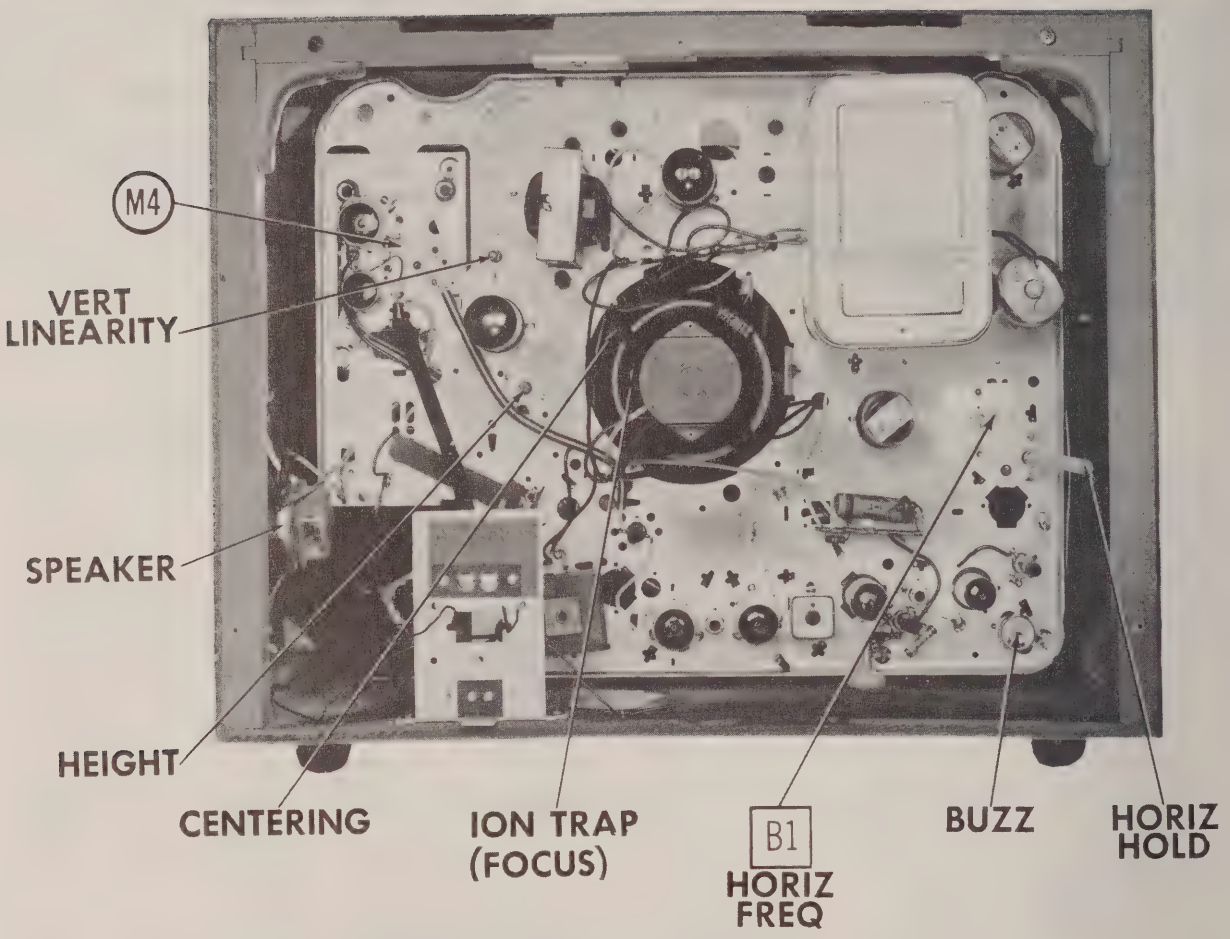
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	AMBASSADOR PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M2		27-226		1T1 ①				Horiz. Phase Det. (Pigtail) ① 2 Required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		AMBASSADOR PART No.	SYLVANIA PART No.	
M3	CK-706A	19C1864	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	AMBASSADOR PART No.	NOTES
M4	Tuner	1D2619	VHF 12 Position.
M5	Centering Device	21B216	
M6	Ion Trap	21B198	
	Handle	30-375	Model 17TT62
	Knob	15-995	Channel Selector, Model 17TT61M.
	Knob	15-996	Channel Selector, Models 17TT61E, 17TT62, 17TT63.
	Knob	15A798	Control (4 used), Models 17TT61E, 17TT62, 17TT63.
	Knob	15C775	Control (4 used), Model 17TT61M.
	Knob	15C762	Fine Tuning
	Safety Glass	22C423	
	Mask	7A625	



CABINET—REAR VIEW

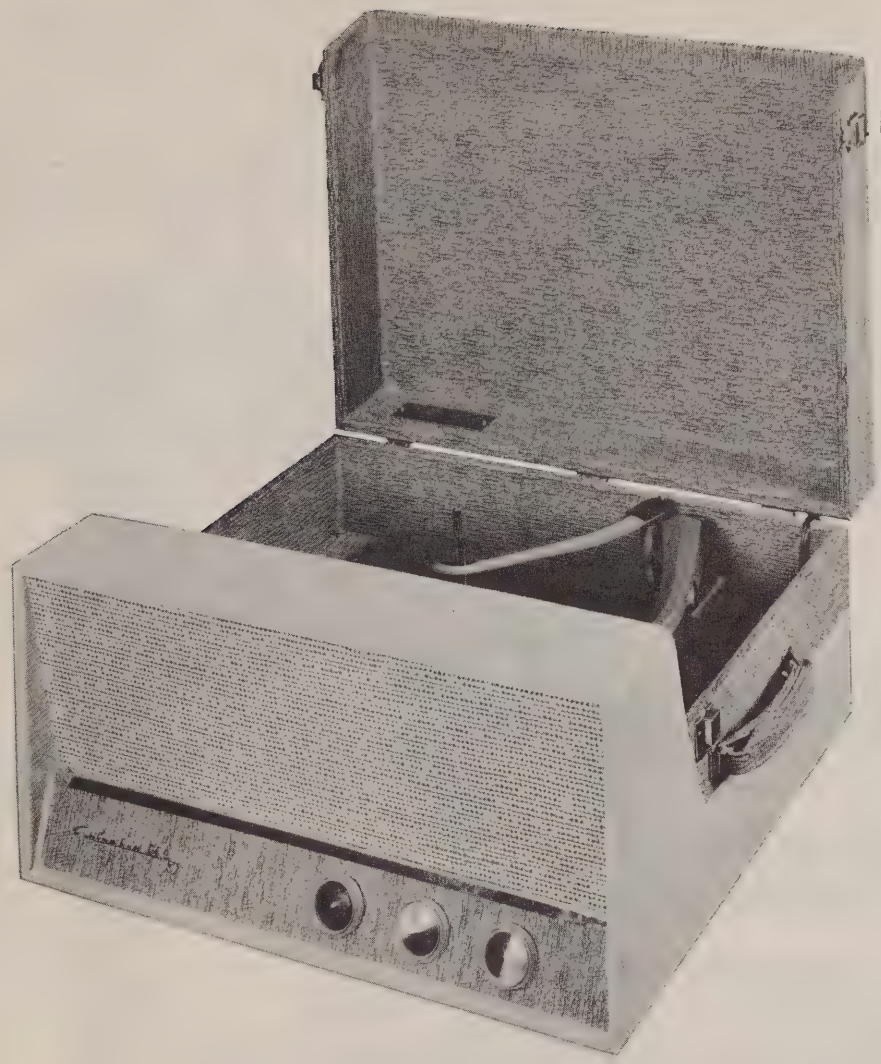
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. If the horizontal hold control fails to maintain sync, set it in the mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Check other channels and if necessary, readjust B1 SLIGHTLY for best sync on all channels.

COLUMBIA RECORDS
MODELS 522, 524, 527

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

COLUMBIA RECORDS
MODELS 522, 524, 527



COLUMBIA RECORDS
MODELS 522, 524, 527

TRADE NAME	Columbia Records Models 522, 524, 527
MANUFACTURER	Columbia Records, 779 Seventh Ave., New York 19, N.Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AX7 AF Amp. -Phase Inv., (2) 50C5 Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .36 Amp. @ 117 Volts AC (34 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE SIMILAR V-M MODEL 1200A - PHOTOFACT SET 353

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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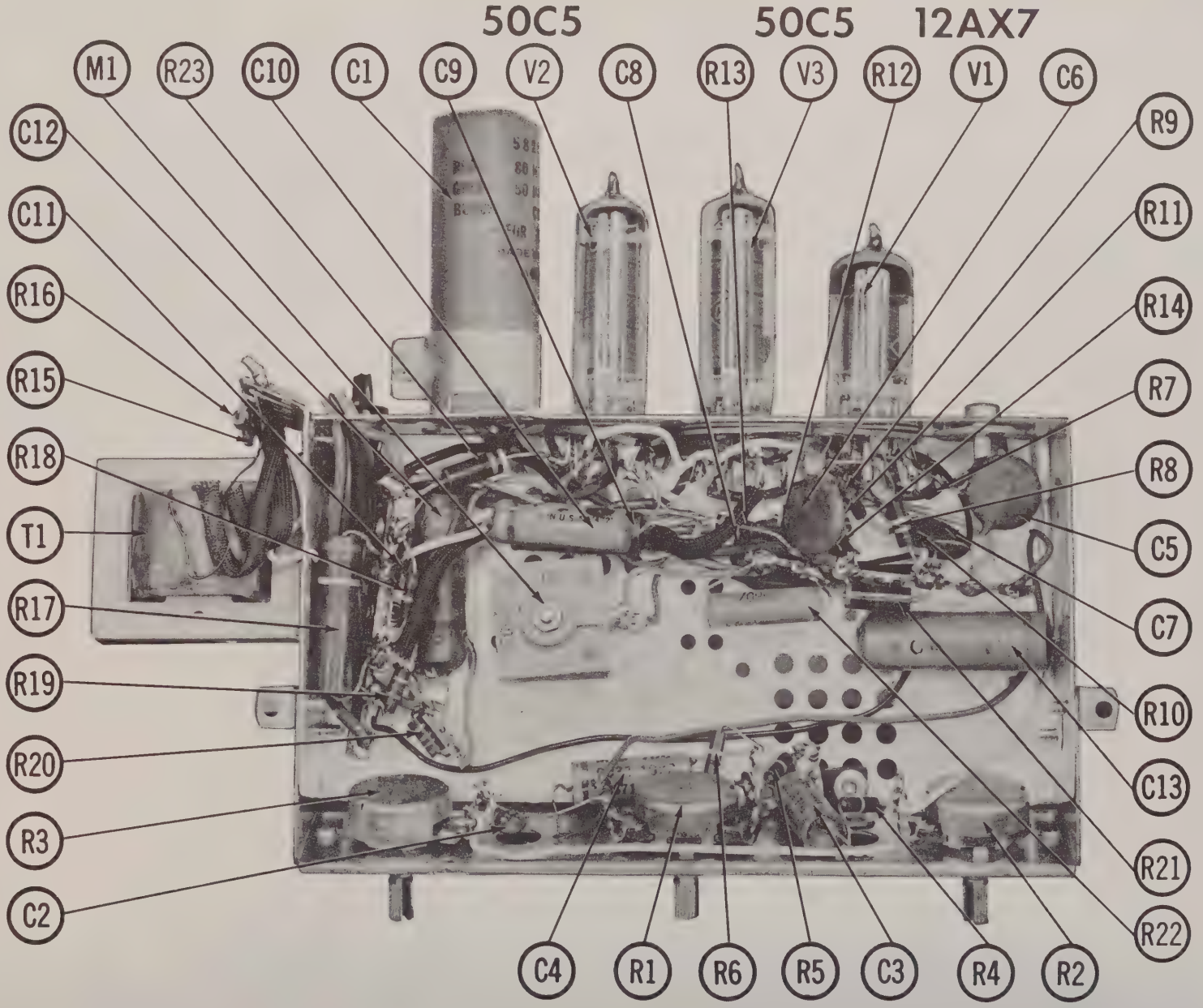


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inverter	12AX7	
V2	Output	50C5	
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	11A710	PRS150V4080	BBRD8515	TCD498	TDLD-12	FMT-1540	TVA-2462
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C3	.0033	1000		HVD-15-3300	DD-302	CUB10D33	1R5KV-332	GEM-10233	10TM-D33	
C4	.0033	1000		HVD-15-3300	DD-302	CUB10D33	1R5KV-332	GEM-10233	10TM-D33	
C5	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.01	400		BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C10	.01	400		BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C11	5000			BPD-005	DD-502	BYA6D5	GP-5000	DC525	5HK-D5	
C12	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C13	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25Meg	½	9A536				UDT303	Volume, Tap③ 1Meg & 2Meg
B	Shaft						Not Req.	
R2A	5Meg	½	9A535	AB-88	A47-5Meg-Z	Q13-141	U65	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R3A	250K	½	9A537	B-50	A47-250K-S	Q11-130	U46	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Columbia Records PART No.	IRC PART No.	NOTES
R4	100K			BTS-100K	
R5	100K			BTS-100K	
R6	100K			BTS-100K	
R7	12Meg			BTS-12Meg	
R8	270K			BTS-270K	
R9	12Meg			BTS-12Meg	
R10	270K			BTS-270K	
R11	47K			BTS-47K	
R12	470K			BTS-470K	
R13	470K			BTS-470K	
R14	100Ω	1		BTA-100	
R15	100K			BTS-100K	
R16	4700Ω			BTS-4700	
R17	10K	2		BTB-10K	
R18	10K			BTS-10K	
R19	5.6Meg			BTS-5.6Meg	
R20	5.6Meg			BTS-5.6Meg	
R21	1000Ω	1		BTA-1000	
R22	50Ω	5		PW7-50	
R23	47Ω	1		BTA-47	Note 1

Note 1: 39Ω 1W used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3600Ω CT	3-4Ω Tap ②1.6Ω	3A212						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Columbia Records PART No.	QUAM PART No.	NOTES
SP1	6" 12"	PM	3-4Ω	1A104 ①④ 1A110 ②	6A1 ④	① Used in models 522, 524. ② Used in model 527. ③ Electrostatic type. ④ Connect in parallel & phase.
SP2 SP3	6"	PM	3-4Ω	1A104 ①④ 1A106 ③	6A1 ④	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.086A	10A606	1005A	RS150	6S150	6M1	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Columbia Records PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M2	TO-400-0V			56	PT-1	

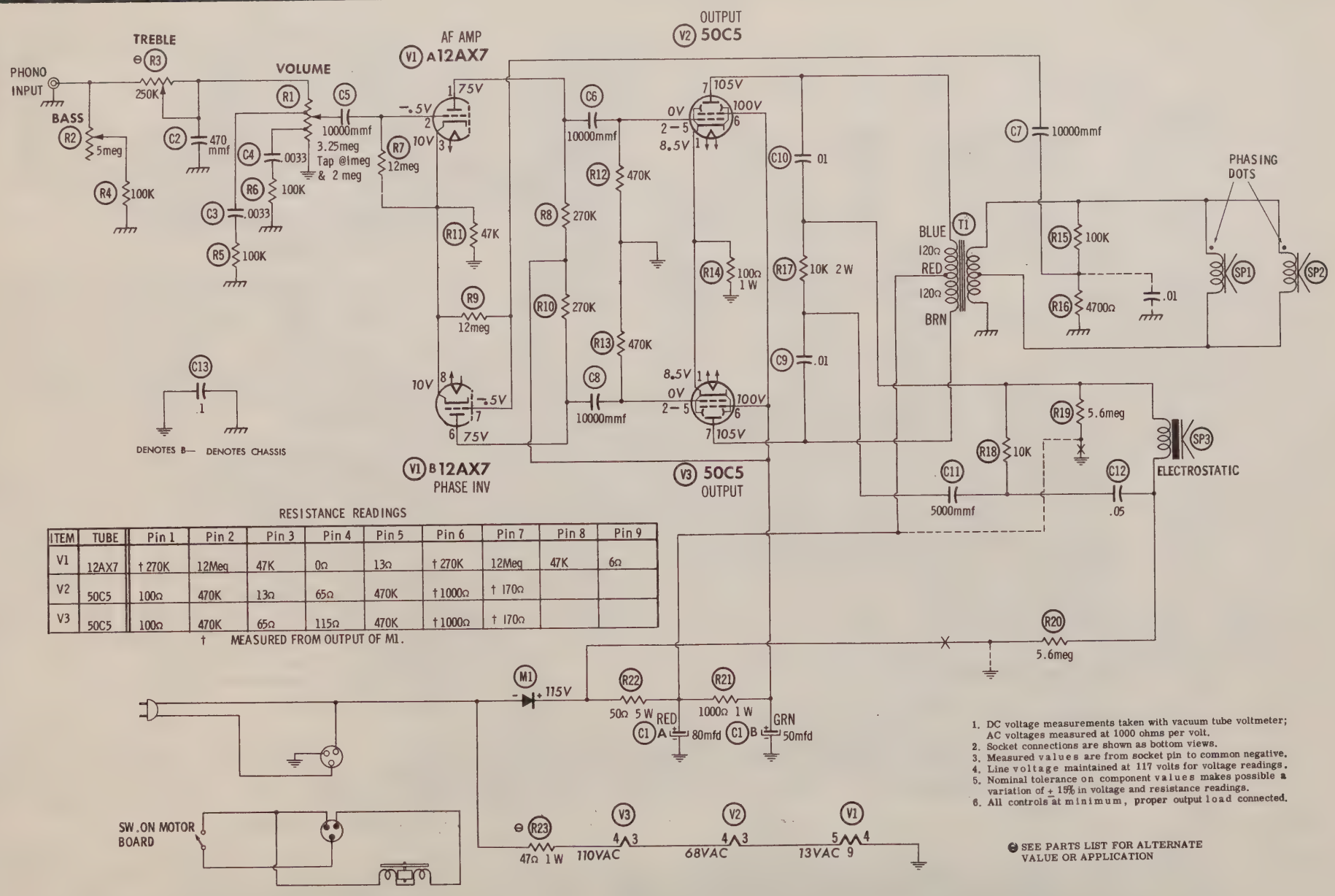
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		†CRA-55 or †CRA-55LP or ♦CRA-55D or ♦CRA-55LPD	†W-64S or †W-64MGS	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
	Knob	8A443	Fruitwood, Models 522, 527.
	Knob	8A441	Mahogany, Model 527.
	Knob	8A442	Blonde, Model 527.
	Knob	8A445	Mahogany, Model 524.
	Knob	8A444	Blonde, Model 524.
	Cabinet	17A926	Model 522.
	Cabinet	17A924	Blonde, Model 524.
	Cabinet	17A925	Mahogany, Model 524.
	Cabinet	17A927	Mahogany, Model 527.
	Cabinet	17A928	Blonde, Model 527.
	Cabinet	17A929	Fruitwood, Model 527.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	12Meg	47K	0Ω	13Ω	†270K	12Meg	47K	6Ω
V2	50C5	100Ω	470K	13Ω	65Ω	470K	†1000Ω	†170Ω		
V3	50C5	100Ω	470K	65Ω	115Ω	470K	†1000Ω	†170Ω		

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

*TRADE MARK

CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

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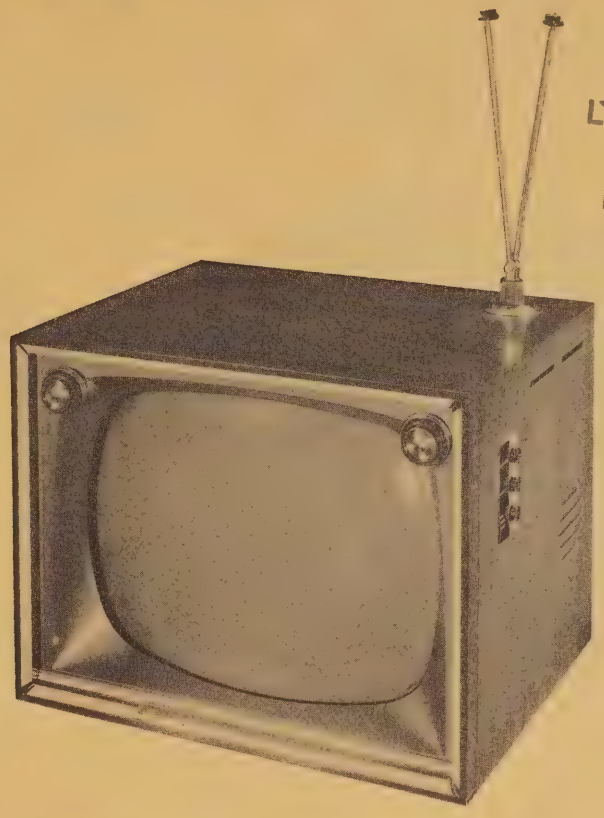

CROSLEY MODEL BT-12MZ (Ch. 489)

TRADE NAME	Crosley	MODELS	CHASSIS
		BC-12BZ, M, MZ, BC-14M, BT-12BZ, M, MZ	489
		BC-13B, M, BC-15M, BT-13B, M	490
MANUFACTURER	Crosley Division, AVCO Manufacturing Corp., Cincinnati 25, Ohio		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 160 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

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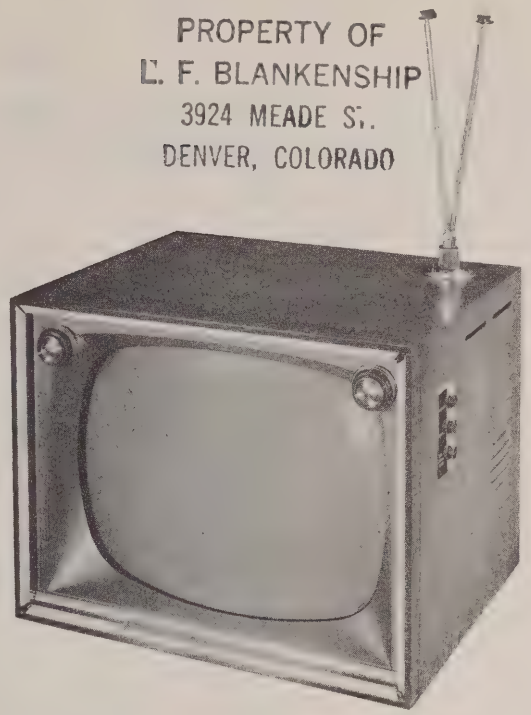
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs.
2. Remove 7 wood screws. Remove rear cover.
3. Remove 1 wood screw holding antenna terminals.
4. Remove 2 wood screws holding AC interlock assembly.
5. Remove 1 wing nut and 1 wood screw. Remove built-in antenna.
6. Remove 3 wood screws holding the 2 chassis side braces.
7. Remove 4 chassis bolts and 3 metal screws from bottom of cabinet.
8. Remove 2 speaker wires.
9. Remove 2 speaker nuts. Remove speaker.
10. Remove chassis.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

MODEL	CHASSIS
BT-12MZ	489

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove volume, contrast, channel selector and fine tuning knobs. Remove 2 wood screws holding metal name plate at bottom. Using extreme caution, remove safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 11.

SPECIAL ADJUSTMENTS

A. Picture Guard

Tune in strongest station in area and adjust local fringe switch. Turn picture guard control fully counter clockwise then advance control only far enough to stabilize picture.

B. Focus

Focus may be varied in steps by position of plug in focus adjustment board. Readjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust the horizontal hold to the center of its range in which the picture remains synchronized horizontally when the channel selector is switched off channel and back again.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control (R9) for MINIMUM buzz.

FUSES

A 7.5Ω fusible resistor (R113) is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

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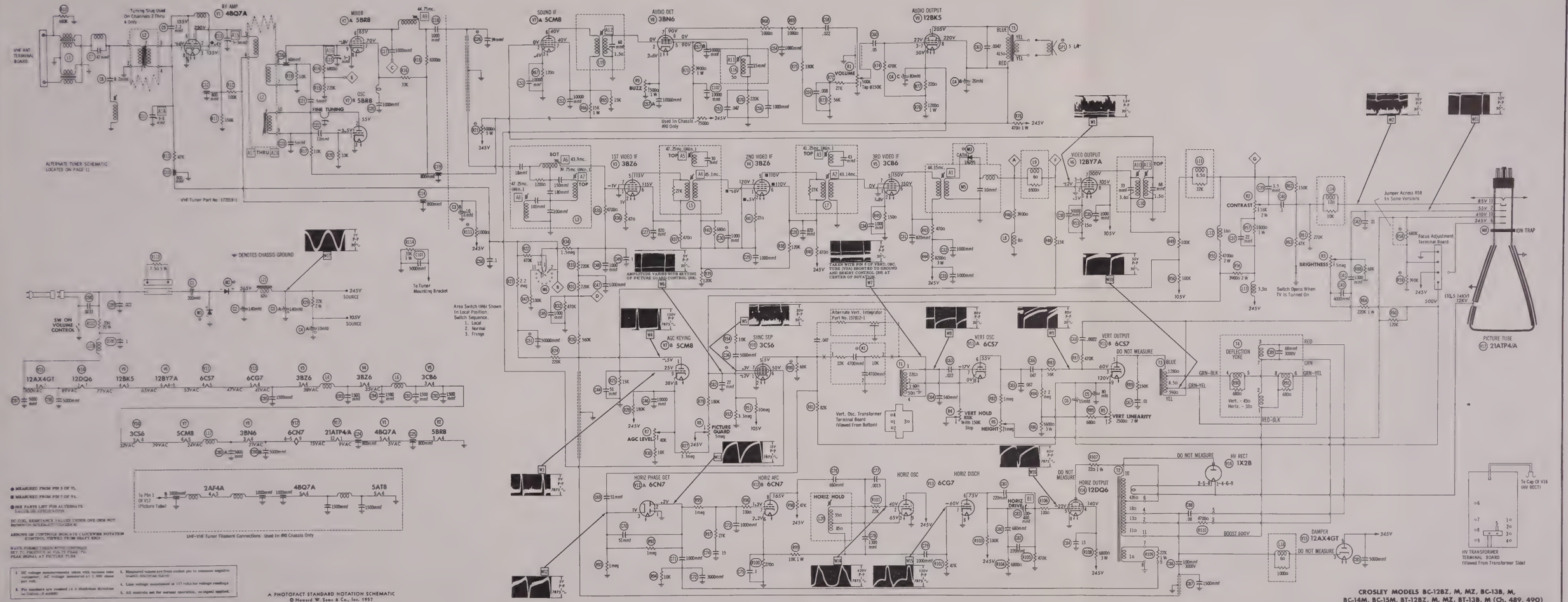
RF AMP V1 4BQ7A
MIXER V2A 5BR8
OSC V2B 5BR8
SOUND IF V7A 5CM8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 12BK5
1ST VIDEO IF V3 3BZ6
2ND VIDEO IF V4 3BZ6
3RD VIDEO IF V5 3CB6
VIDEO OUTPUT V6 12BY7A
AGC KEYING V7B 5CM8
SYNC SEP V10 3CS6
VERT OSC V11A 6CS7
VERT OUTPUT V11B 6CS7
HORIZ PHASE DET V12A 6CN7
HORIZ AFC V12B 6CN7
HORIZ OSC V13 6CG7
HORIZ DISCH
HORIZ OUTPUT V14 12DQ6
HV RECT V16 1X2B
DAMPER V15 12AX4GT
PICTURE TUBE V17 21ATP4/A
VHF ANT TERMINAL BOARD
ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 11
VHF Tuner Part No 172018-1
FINE TUNING
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
245V SOURCE
105V SOURCE
To Tuner Mounting Bracket
Area Switch (M6) Shown In Local Position. Switch Sequence. 1. Local 2. Normal 3. Fringe
AMPLITUDE VARIES WITH SETTING OF PICTURE GUARD CONTROL (R85)
TAKEN WITH PIN 4 OF VERT. OSC. TUBE (V11A) SHORTED TO GROUND AND BRIGHT CONTROL (R9) AT CENTER OF ROTATION
Alternate Vert. Integrator Part No. 157812-1
Vert. Osc. Transformer Terminal Board (Viewed From Bottom)
VERT HOLD 100K With 150K Stop
HEIGHT
VERT LINEARITY 2500Ω 2W
CONTRAST
BRIGHTNESS
Focus Adjustment Terminal Board
ION TRAP
Jumper Across R58 In Some Versions
Switch Opens When TV Is Turned On
DEFLECTION YOKE
Vert. - 43Ω Horiz. - 32Ω
DO NOT MEASURE
BOOST 500V
HV TRANSFORMER TERMINAL BOARD (Viewed From Transformer Side)
To Cap Of V16 (HV RECT)
12AX4GT 7.5Ω 5W
12CQ6 12BK5 12BY7A 6CS7 6CG7 3BZ6 3BZ6 3CB6
3CS6 5CM8 3BN6 6CN7 21ATP4/A 4BQ7A 5BR8
2AF4A 4BQ7A 5AT8
To Pin 1 Of V17 (Picture Tube)
UHF-VHF Tuner Filament Connections Used In 490 Chassis Only
◆ MEASURED FROM PIN 5 OF V1.
■ MEASURED FROM PIN 7 OF V4.
SEE PARTS LIST FOR ALTERNATE
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
SET TV PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction
3. Measured values are from socket pin to common negative (cabinet) electrical point.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
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CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

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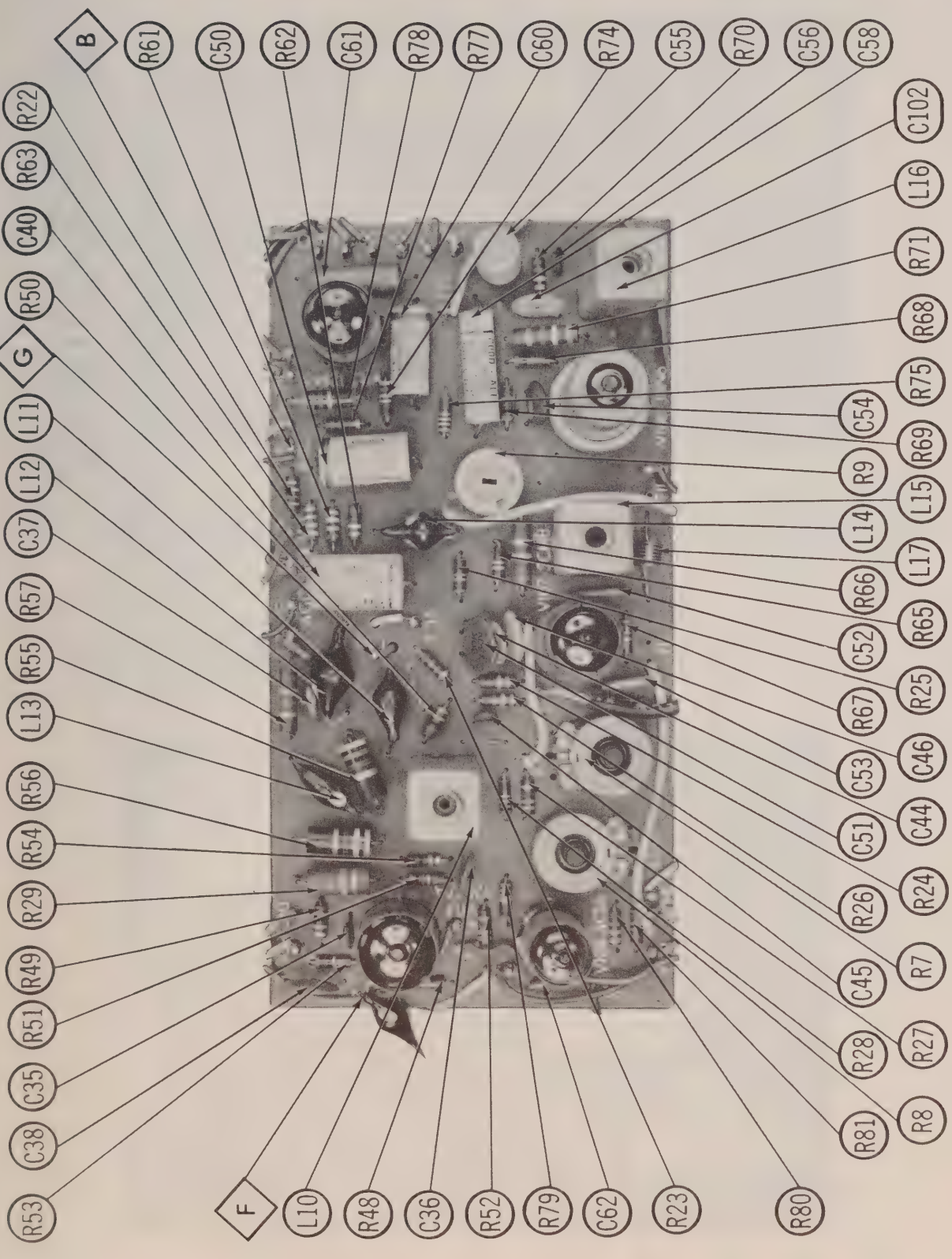
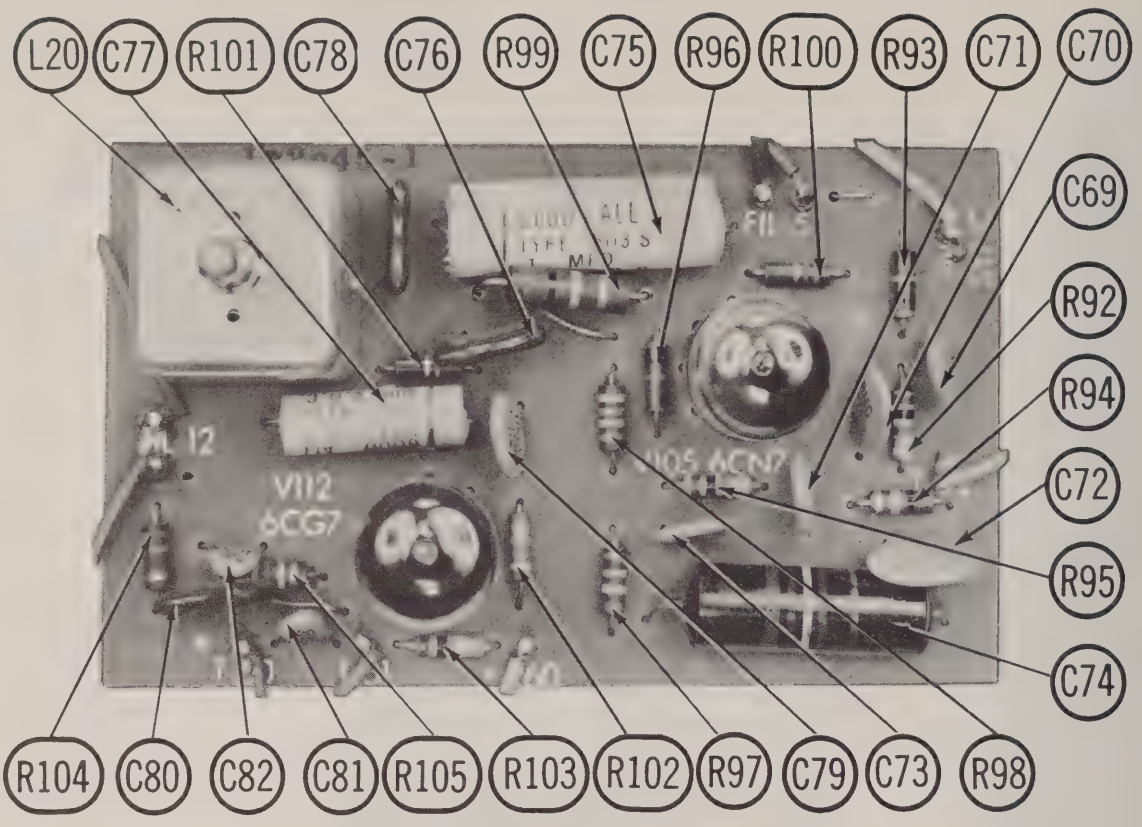
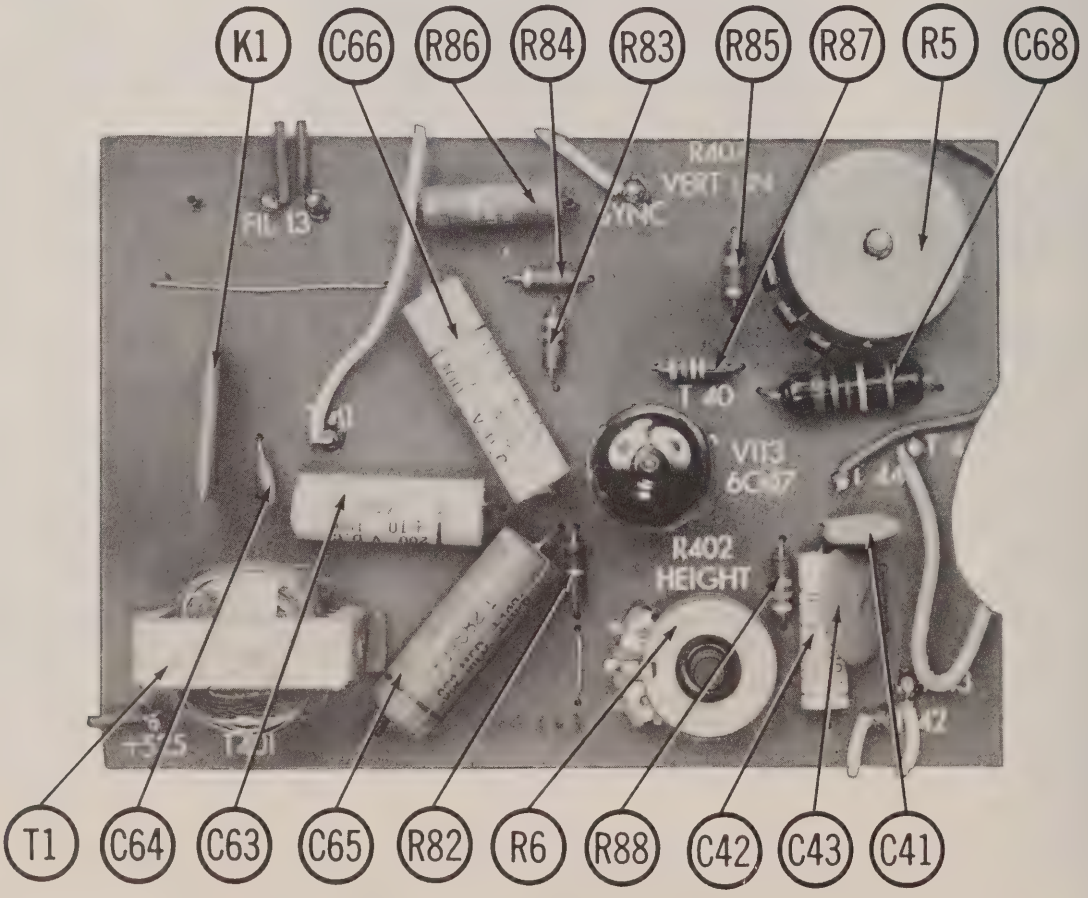


PICTURE PRINTED BOARD



HORIZONTAL PRINTED BOARD



VERTICAL PRINTED BOARD

TUBE PLACEMENT CHART

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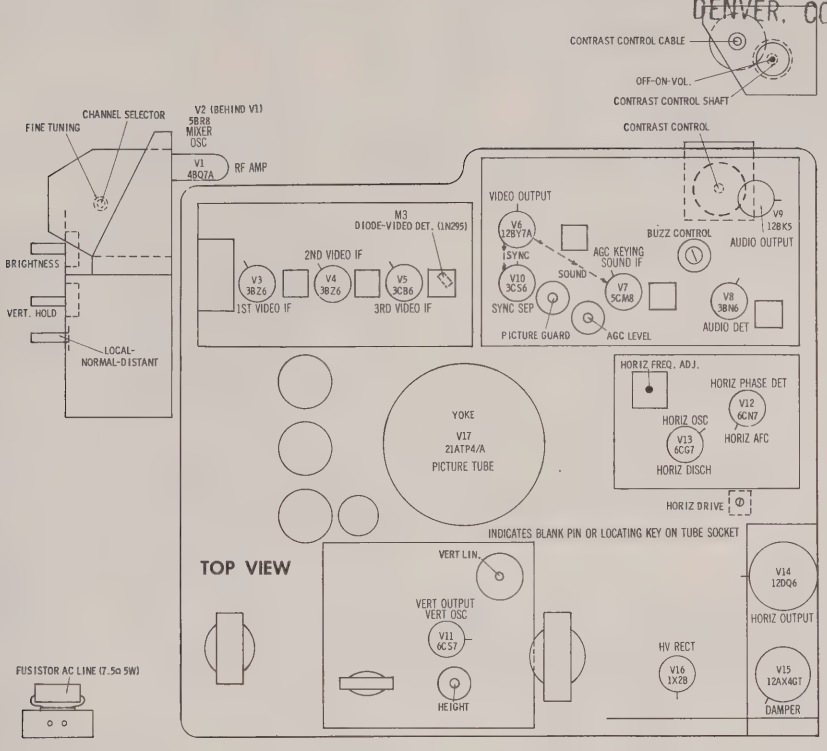


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

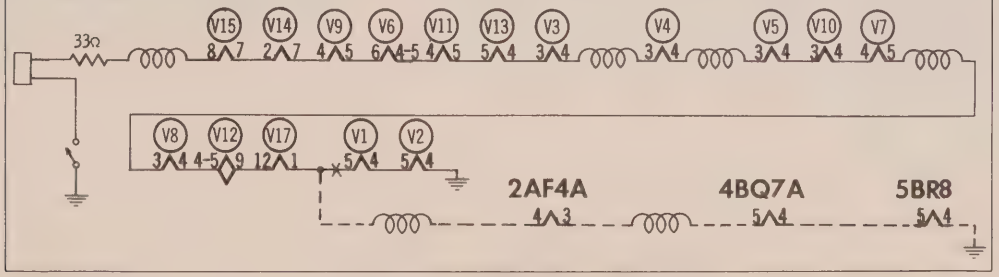
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R113), Rectifier (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode M3, V6, V7
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16, V17
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, M1, M2
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



SET 352 FOLDER 5

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

All leads from the marker and sweep generator must be shielded and exposed ends kept as short as possible. Make all ground connections as near the hot leads as possible.
The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Turn AGC level control clockwise, contrast control counter clockwise, picture guard control fully counter clockwise and area switch to normal.
Connect the negative lead of a 3 volt bias supply to point (B). Positive to chassis. Connect the negative lead of a second 3 volt bias supply to point (D). Positive to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to point (C). Low side to chassis.	44.15MC	Any non-interfering channel.	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection on VTVM. Use first peak from chassis end of coil.
2.	"	"	43.14MC	"	"	A2	"
3.	"	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection on VTVM. Use null point farthest from chassis. Repeat steps 2 and 3.
4.	"	"	45.1MC	"	"	A4	Adjust for maximum deflection. Use peak nearest chassis end of coil.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Use null point with slug farthest from chassis. Repeat steps 4 and 5.
6.	"	"	43.9MC	"	"	A6	Adjust for maximum deflection on VTVM. Use peak nearest chassis end of coil.
7.	"	"	39.75MC	"	"	A7	Adjust for MINIMUM deflection. Use null point farthest from chassis.
8.	"	"	47.25MC	"	"	A8	Adjust for MINIMUM deflection. Use null point farthest from chassis. Repeat steps 6, 7 and 8.
9.	"	High side to point (E). Low side to chassis.	44.75MC	"	"	A9	Connect a 100Ω resistor and a 100MMF capacitor from pin 1 (grid) of 3BZ6 (V3) to chassis. Adjust A9 for maximum deflection on VTVM. Remove cap. and resistor.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	44.0MC (10MC Swp)	39.75MC 41.25MC 42.75MC 45.75MC 47.25MC	Any non-interfering channel.	Vert. amp. thru 68K to point (A). Low side to chassis.		Check for response similar to Fig. 1 with markers as indicated. If necessary retouch A1 through A9 as needed.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to point (F). Low side to chassis.	4.5MC (400∿ 30% AM Mod.)	Any non-interfering channel.	Vert. amp. thru detector probe to point (G). Low side to chassis.	A10	Turn A10 clockwise several turns and A13 several turns counter clockwise. Adjust A10 for MINIMUM 400∿ indication on scope. Use null point nearest chassis.

SOUND IF ALIGNMENT USING TV SIGNAL

NOTE: 4.5MC trap must be adjusted first. See step 11.
The picture guard control should be adjusted before alignment.
1. Tune in a strong TV signal and set the buzz control approximately 90° from full clockwise position. Adjust A11 for maximum sound output. The second peak from the open end of the coil is the correct setting for the slug.
2. Reduce the signal strength below the limiting level of the 3BN6, as indicated by a hiss in the sound similar to super regeneration, by inserting an attenuator between the antenna leads and the receiver terminals. The signal may also be attenuated by disconnecting the antenna and placing the leads near the antenna terminals. Adjust A12 and A13 for maximum volume output.
3. Using the same weak signal, adjust the buzz control (R9) for MINIMUM hash.
4. Reduce the attenuation to zero or reconnect the antenna and readjust A11 for maximum volume. Repeat steps 2, 3 and 4.

SOUND IF ALIGNMENT USING TEST EQUIPMENT

NOTE: 4.5MC trap must be adjusted first. See step 11.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to point (F). Low side to chassis.	4.5MC (FM Mod. 400∿ 15KC & Swp.)	Any non-interfering channel.	Across speaker terminals.	A11	Preset buzz control (R9) 90° from full clockwise. Use sufficient signal input to assure limiting and adjust A11 for maximum amplitude on scope. Use second peak from the open end of coil.
13.	"	"	"	"	"	A12	Reduce signal input below the limiting level of the 3BN6. Adjust for maximum scope indication.
14.	"	"	"	"	"	A13	"
15.	"	"	4.5MC (AM Mod. 400∿)	"	"	R9	Increase signal input above limiting level of 3BN6. Adjust R9 for MINIMUM 400∿ indication on scope. Repeak A11 as in step 12. Repeat steps 13 and 14 with signal below limiting level.

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect the bias as under "Overall Video IF Response Check".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point (B). Low side to chassis.	A14, A15, A16	Adjust for response curve similar to Fig. 2 with markers above 90%.
17.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 2. If markers fall below 70% on any channel, make compromise adjustments of A14, A15 and A16 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

VHF OSCILLATOR ALIGNMENT

Leave bias connected as under "RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point (A). Low side to chassis.	A17	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A18	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A19	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A20	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A21	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A22	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A23	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A24	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A25	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A26	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A27	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A28	

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

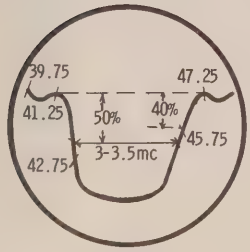


FIG. 1

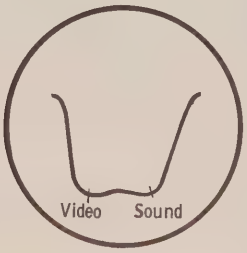


FIG. 2

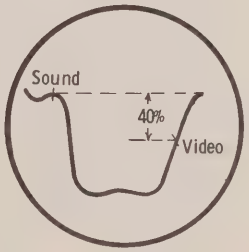
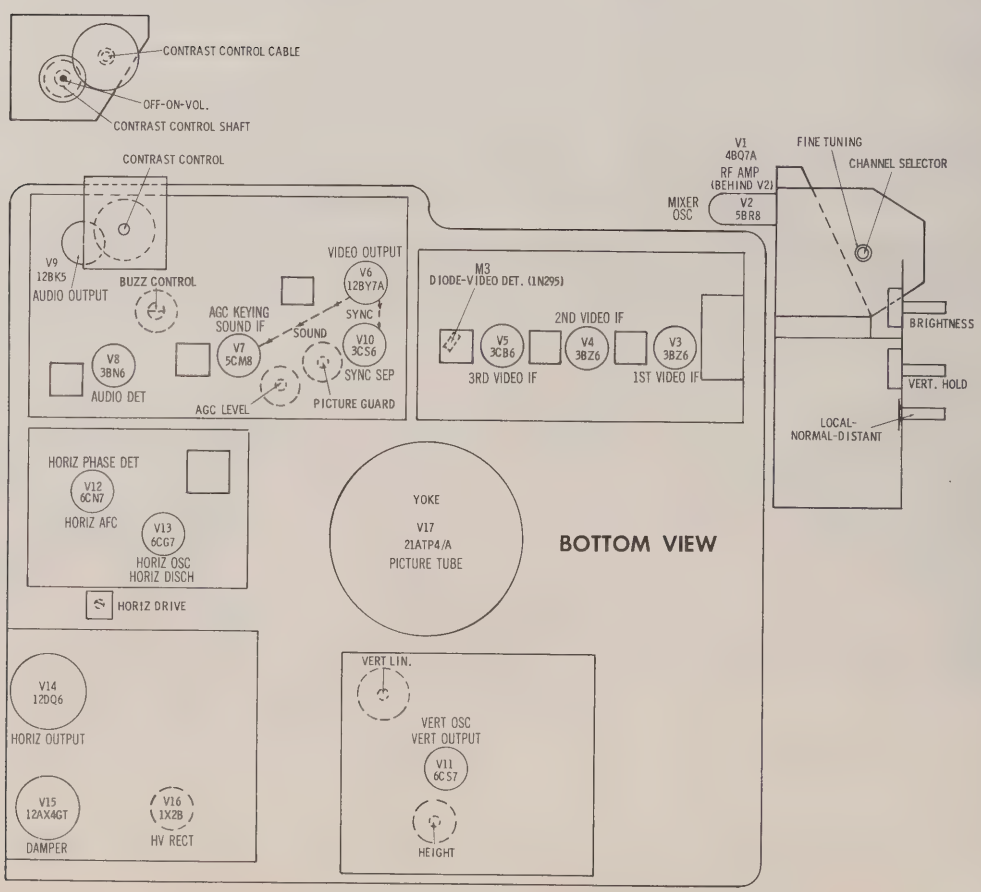


FIG. 3

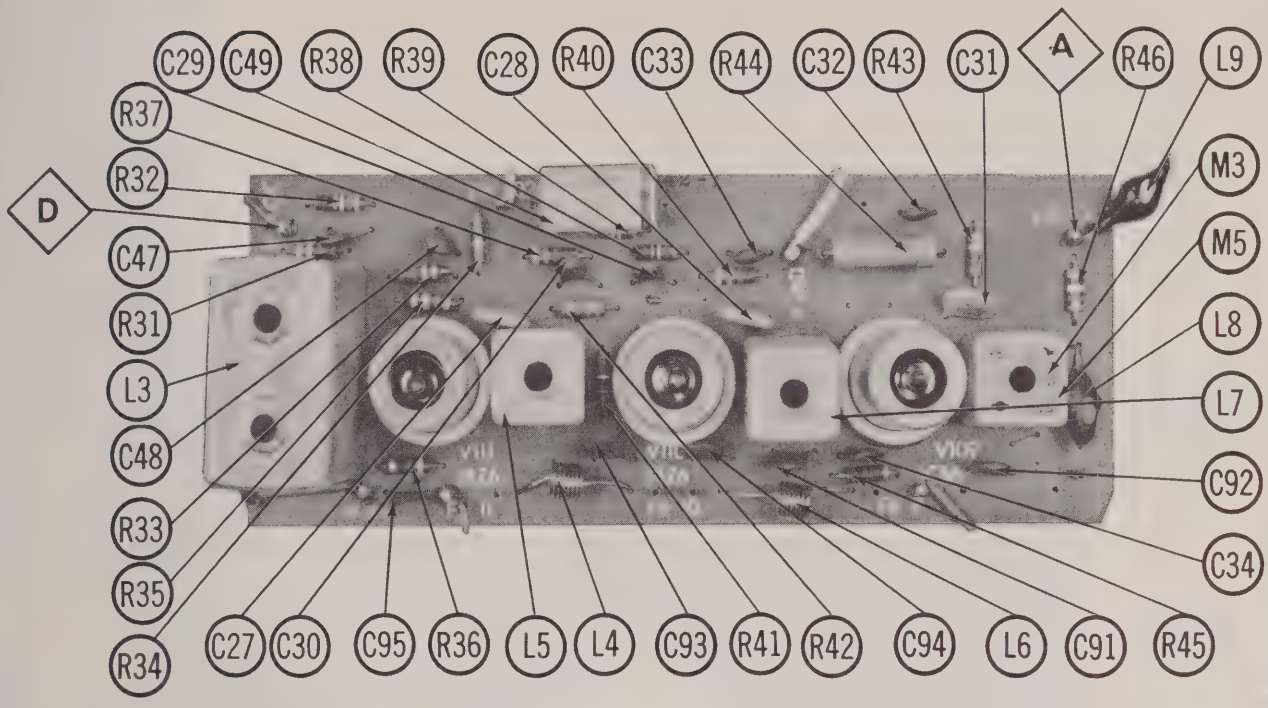
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BQ7A	†1000Ω	60K	INF	1.3Ω	2.5Ω	INF	3.4Meg	0Ω	0Ω
V2	5BR8	10K	†15K	0Ω	0Ω	1.3Ω	†13K	†40K	0Ω	227K
V3	3BZ6	900K	47Ω	9.5Ω	8.5Ω	■ 470Ω	■ 470Ω	0Ω		
V4	3BZ6	■ 680Ω	■ 27Ω	8.5Ω	8Ω	†530Ω	†530Ω	60K		
V5	3CB6	.1Ω	150Ω	8Ω	7Ω	†8700Ω	†8700Ω	0Ω		
V6	12BY7A	15Ω	4000Ω	0Ω	12.5Ω	12.5Ω	14Ω	†5600Ω	†22K	0Ω
V7	5CM8	900K	1.5Ω	120Ω	6.5Ω	5.5Ω	†15K	†15K	● 30K	15K
V8	3BN6	● 275Ω	1.5Ω	5.5Ω	4.5Ω	†9000Ω	220K	†330K		
V9	12BK5	†1000Ω	NC	470K	16Ω	14Ω	1400Ω	470K	†530Ω	NC
V10	3CS6	18K	0Ω	7Ω	6.5Ω	38K	1400Ω			
V11	6CS7	‡1300Ω	NC	2.2Meg	12.5Ω	11Ω	‡2.4Meg	● 350K	60Ω	7000Ω
V12	6CN7	0Ω	2Meg	1Meg	4.5Ω	4.5Ω	270Ω	3Meg	†47K	3.7Ω
V13	6CG7	†62Ω	32K	10K	9.5Ω	11Ω	†100K	47K	0Ω	0Ω
V14	12DQ6	NC	19Ω	NC	†6800Ω	470K	TP	16Ω	0Ω	TOP CAP ‡46Ω
V15	12AX4GT	NC	TP	370K	NC	†62Ω	TP	19Ω	22Ω	
V16	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡460Ω
V17	21ATP4/A	2.5Ω	68K	Pin 6 †62Ω	Pin 10 ‡120K	Pin 11 30K	Pin 12 3.7Ω			

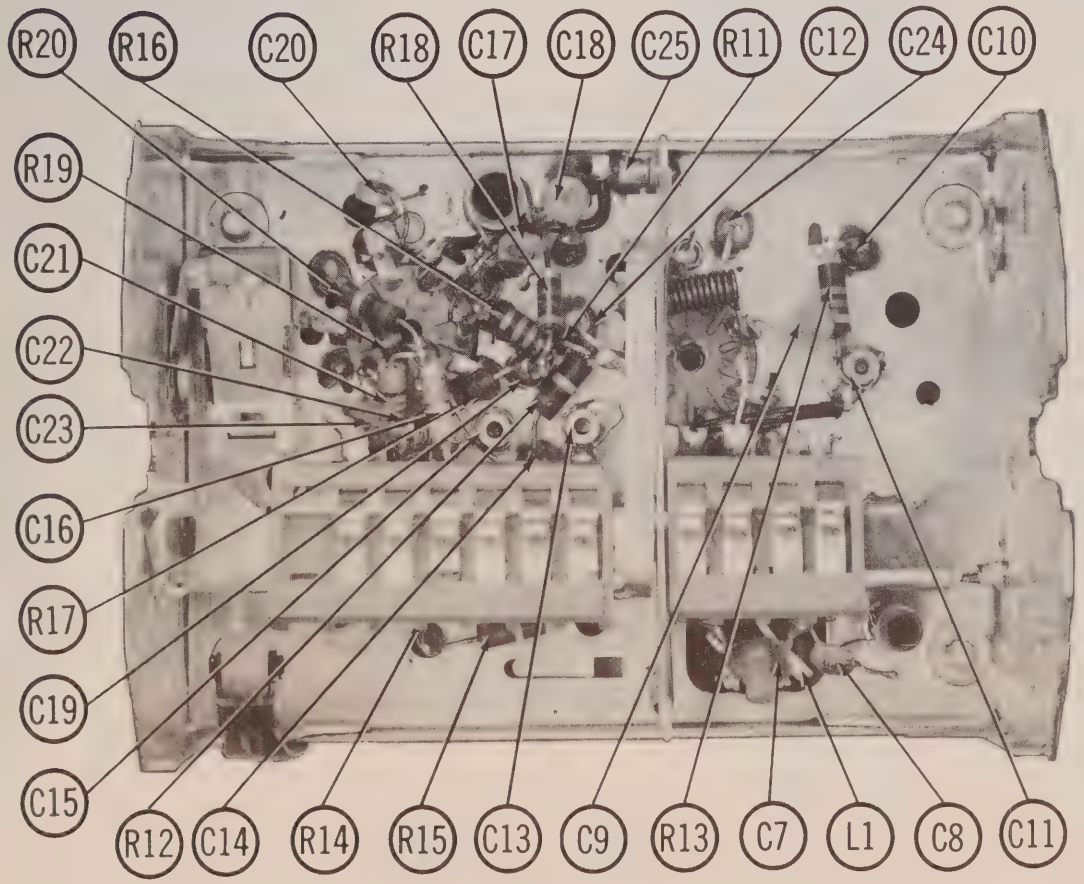
† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V15.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
■ MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION
TP TIE POINT



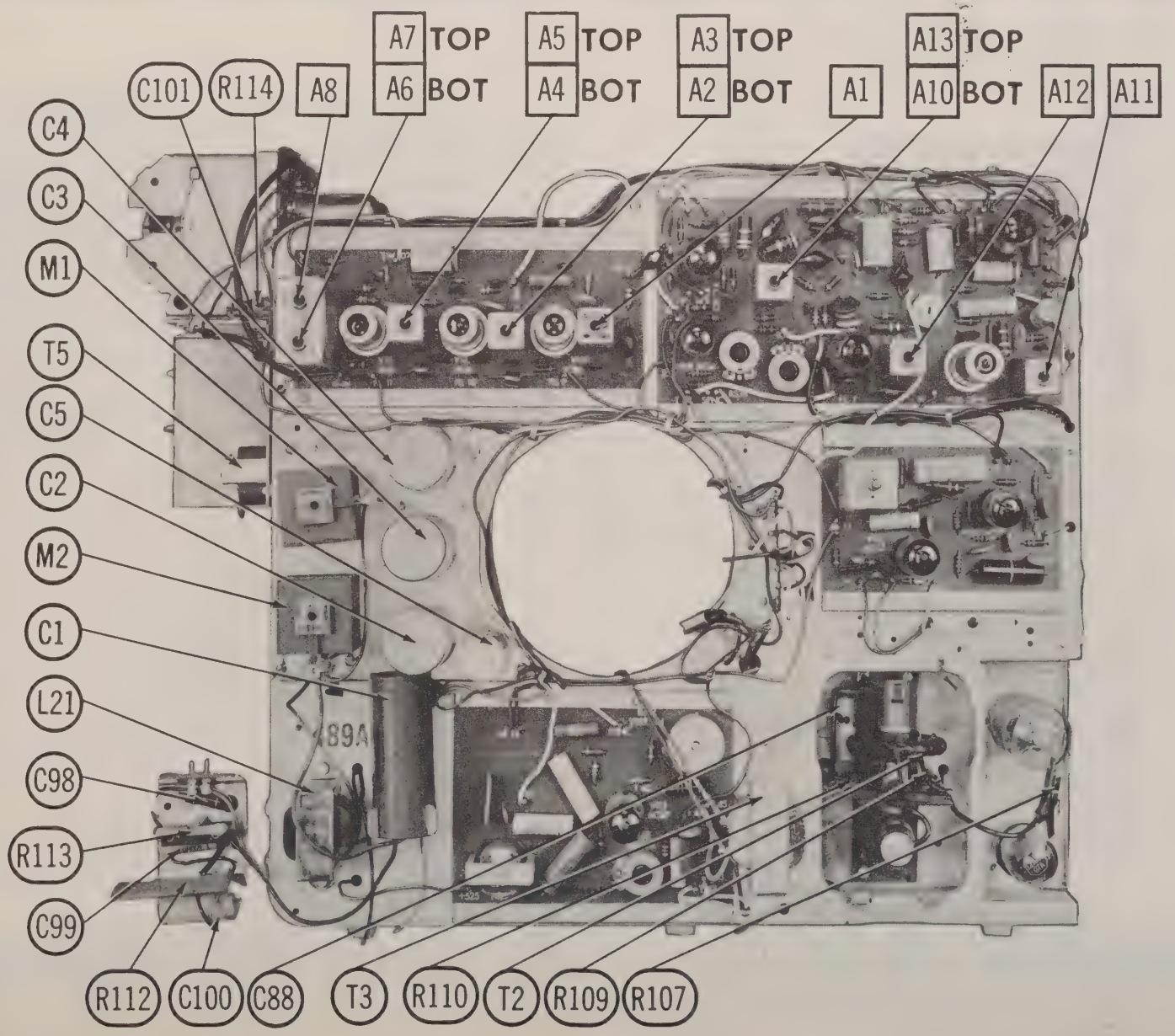
TUBE PLACEMENT CHART



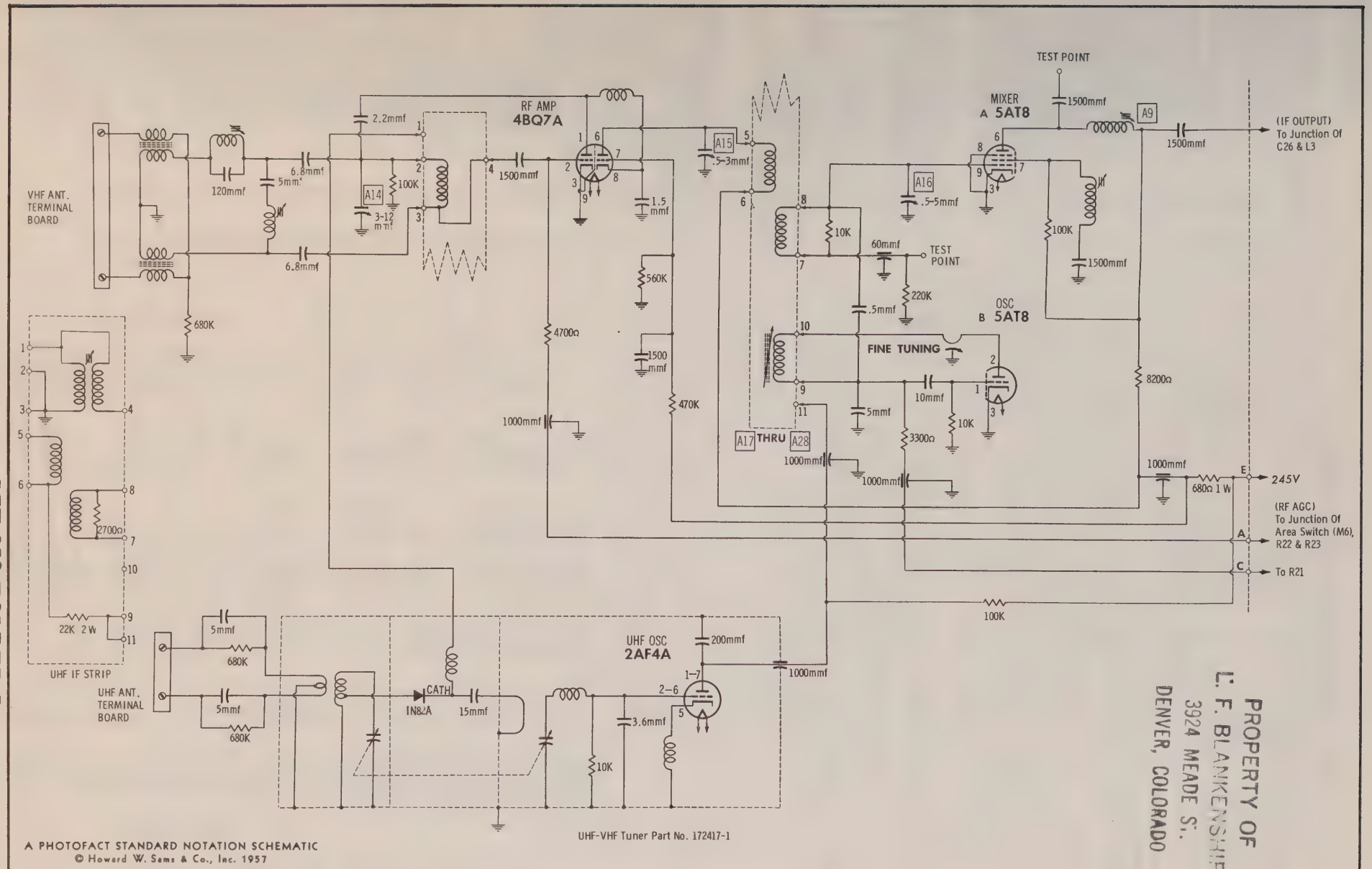
VIDEO IF PRINTED BOARD



TUNER BOTTOM VIEW



CHASSIS TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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3924 MEADE ST.
DENVER, COLORADO

ALTERNATE UHF-VHF TUNER SCHEMATIC

CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, M, MZ, BT-13B, M (Ch. 489, 490)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	4BQ7A	
V2	Mixer-Osc.	5BR8	
V3	1st Video IF Amplifier	3BZ6	
V4	2nd Video IF Amplifier	3BZ6	
V5	3rd Video IF Amplifier	3CB6	
V6	Video Output	12BY7A	
V7	AGC Keying-Sound IF	5CM8	
V8	Audio Det.	5BN6	
V9	Audio Output	12BK5	
V10	Sync Sep.	3CS6	
V11	Vert. Osc. - Vert. Output	6CS7	
V12	Horiz. Phase Det. - Horiz. AFC	6CN7	
V13	Horiz. Osc. -Horiz. Disch.	6CG7	
V14	Horiz. Output	12DQ6	
V15	Damper	12AX4GT	
V16	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	CROSLEY PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V17	21ATP4/A	21ATP4 ①	21ATP4A/21ATP4 ①	21ATP4, A ② 21ATP4A ② 21BTP4	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	CROSLEY PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	200	172629-1	PRI-075	XA0318	FP126	TD-200-200	D-100	TVA-1408
C2	140	350	172902-1	AFH81-43	BO354	FP140	TMS-48	S-230	TVL-1641
C3A	▲140	350	172026-1	AFH2-41-80	DO044	FP229.3		D-177	TVL-2643
B	▲10	350				TC62		MT-4510	
C4A	●10	350	172027-1	AFH3-30-60	DO040	FP333.8	TMQ-6	Q-200	TVL-3689
B	▲20	350						MT-1580	
C	▲80	150							
C5	80	150	172025-1	AFH1-20	XA0231	FP128	TMS-21	S-085	TVL-1420
C6	15	525	172226-1	PRS800V16	BHRV616	TC83	TD-16-600		TVA-1965

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	47			NP0-S1 47	TCZ-47	C10Q47C	TCO-47		5TCC-Q47	
C8	8.2			NP0-S1 8. 2		C10V82C	TCO-8. 2			
C9	2. 2			NP0-S1 2. 2	TCZ-2R2	C10V22C	TCO-2. 2		5TCCB-V22	
C10	800									
C11	3-8									
C12	800									
C13	. 5-3				829-3		3115-D	CT565A		
C14	800									
C15	. 5-3				829-3		3115-D	CT565A		
C16	60									
C17	1000			BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C18	1000			BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C19	800									
C20	1000			BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C21	. 5									
C22	10			BPD-00001	DD-100	L10TQ1	KD-10	UC-541	5GA-Q1	
C23	5			NP0-S1 5		L10V5	KD-5	2T-555	5TCCB-V5	
C24	800									
C25	800									
C26	39		158215-101							Note 1 (N-15)
C27	820		158215-53	BPD-0008	D6-821	L10T82	KD-820			
C28	820		158215-53	BPD-0008	D6-821	L10T82	KD-820			
C29	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C30	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C31	820		158215-53	BPD-008	D6-821	L10T82	KD-820			
C32	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C33	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C34	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C35	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C36	5000		158215-25	BPD-005	DD-502	BYA10D5	KD-005	DC525	5HK-D5	Note 2
C37	22		158215-93	BPD-000022	D6-220	L10Q22	KD-22	UC-5422	5GA-Q22	
C38	50000		158215-104	BPD-05	DD-503					
C39	3. 5		158215-27							
C40	. 1	150	172355-1	P288N-1	DF-104	CUB2P1		GEM-2G1	2TM-P1	
C41	1000		158215-43	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C42	. 01	200	39478-34	BPD-01	DD-103	CUB3S1	KD-01	GEM-2S1	5TM-S1	
C43	4000		158215-67	BPD-004	D6-402	BYA10D4	KD-004	UC-534	5HK-D4	
C44	51		158215-98							
C45	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C46	1000		158215-57	BPD-01	DD-103	BYA6S1	KD-01	DC511	5HK-S1	
C47	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C48	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C49	. 1	150	172355-1	P288N-1	DF-104	CUB2P1		GEM-2I1	2TM-P1	
C50	. 1	150	172355-1	P288N-1	DF-104	CUB2P1		GEM-2I1	2TM-P1	
C51	50000		158215-104	BPD-05	DD-503					Note 3
C52	10000		158217-57	BPD-01	DD-103	BYA6S1	KD-01	DC511	5HK-S1	
C53	10000		158217-57	BPD-01	DD-103	BYA6S1	KD-01	DC511	5HK-S1	
C54	1000		158215-17	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C55	.047	200	190505-7	BPD-05	DF-503	BC6S472		ACE2147	2SE-S47	
C56	1000		144675-28	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C57A	10000		158215-80	BPD-2X01	DDM2-103	BYD6D61	KD-01	DC511	5HK-S1	
B	10000						KD-01	DC511	5HK-S1	
C58	. 022	200	39478-43	BPD-02	DF-303	CUB2S22	KD-02	GEM-2122	2TM-S22	
C59	. 008	600	39001-78	P688N-008		CUB6D8			6TM-D8	
C60	. 05	150	172355-3	BPD-05	DF-503	CUB3S5		GEM-215	2TM-S5	
C61	. 0047	600	39478-39	BPD-0047	DD-472	CUB4D47	KD-0047	GEM-6247	6TM-D47	
C62	27		158215-97							N75
C63	. 022	200	39478-43	BPD-02	DD-203	CUB2S22	KD-02	GEM-2122	2TM-S22	
C64	560		144675-32		DD-561	L10T56	KD-560	UC-5356	5GA-T56	
C65	. 082	400	172498-1			CUB4S82			4TM-S82	
C66	. 047	400	39478-38	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C67	. 01	600	39478-61	BPD-01	DD-103	CUB6S1	KD-01	GEM-611	6TM-S1	
C68	. 0022	600	172499-3	BPD-0022	D6-222	CUB6D22	KD-0022	GEM-6222	6TM-D22	
C69	51		158215-96							N75
C70	51		158215-96							N75
C71	1000		158215-43	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C72	3000		158215-81	BPD-0033	DD-302	BYA10D3	KD-003		5GA-D3	
C73	1000		158215-42	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C74	. 15	200	39478-14	P288N-15		CUB2P15		GEM-2015	2TM-P15	
C75	. 1	200	39478-30	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C76	680		137499-32	1464-00068		1R5T68			MS-368	
C77	. 0015	400	39478-36	BPD-0015	DD-152	CUB4D15	KD-0015	GEM-4215	4TM-D15	
C78	1300		137499-67	1464-0012		1R5D13			MS-213	
C79	1000		158215-43	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C80	680		137499-32	1464-00068		1R5T68			MS-368	
C81	220		158215-63	BPD-0002	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C82	220		158215-63	BPD-0002	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C83	100-400		159882-1							
C84	. 15	400	39001-20	P488N-15		CUB4P15			4TM-P15	
C85	5000		144675-2	BPD-005	DD-502	BYA10D5	ED-005	GEM-4015	5HK-D5	
C86	100	1000	158215-33							
C87	1500		158215-61	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C88	. 08		159439-1	P286N-08		CUB388		GEM-218	2TM-S8	
C89	68	3000	158215-3							N1400
C90A	5000		158215-103	BPD-2X0047	DD2-502	BYC6DD5	ED-005	DC525	5HK-2D47	
B	5000						ED-005	DC525		
C91	1500		144675-30	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C92	1500		144675-30	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C93	1500		144675-30	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C94	1500		144675-30	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C95	1500		144675-30	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C96	5000		144675-2	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C97	5000		144675-2	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C98	. 0033	600	157694-2	BPD-0033	D6-332	CUB6D33	ED-0033	GEM-6233	6TM-D33	
C99	. 022	600	39478-43	BPD-02	DF-203	CUB6S22	ED-02	GEM-6122	6TM-S22	
C100	. 1	600	39478-47	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C101	1500		158215-4	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C102	10000		158215-57	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

Note 1: A 30MMF capacitor (part #158215-102) is used in this application in chassis 490.
Note 2: A 1500MMF capacitor is used in this application in chassis 489 Code A.
Note 3: A 1000MMF capacitor is used in this application in chassis 489 Code A.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROSLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	171814-1				UT-430	Volume - Tap② 150K
B	Shaft						DS-37	
C	Switch						US-27	
R2	16K	2	172172-1				R20ML	Contrast
R3	5Meg	½	171716-1			Q17-141		Brightness
R4A	800K	½	171717-1	*B-69	*A47-1Meg-S	Q11-136*	U54*	Vert. Hold-With 150K Stop
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5	2500Ω	2	172275-1	WW-252				Vert Lin.
R6	5Meg	½	172235-1					Height
R7	40K	½	172236-1					AGC Level
R8	5Meg	½	172235-1					Picture Guard
R9	500Ω	1	172171-1					Buzz (Wire-wound)

* Use 150K resistor in series with left hand terminal and yellow wire.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
R10	680K			BTS-680K	
R11	150K			BTS-150K	
R12	100K		39374-49	BTS-100K	
R13	47K		39374-45	BTS-47K	
R14	6800Ω		39374-35	BTS-6800	
R15	220K		39374-53	BTS-220K	
R16	33K			BTS-33K	
R17	10K		39374-37	BTS-10K	
R18	8200Ω			BTS-8200	
R19	10K		39374-37	BTS-10K	
R20	10K		39374-37	BTS-10K	
R21	5000Ω	5	158230-10	PW7-5000	Note 1
R22	470K		39374-57		
R23	2.2Meg		39374-69		
R24	220K		39374-53		
R25	15K		39374-39	BTS-15K	
R26	560K		39374-58		
R27	3.3Meg		39374-73		
R28	180K		39374-52	BTS-180K	Note 4
R29	22K	2		BTB-22K	
R30	15K		39374-40	BTS-15K	
R31	220K		39374-53		
R32	470K		39374-57	BTS-470K	
R33	220K		39374-53	BTS-220K	
R34	1.5Meg		39374-63	BTS-1. 5Meg	
R35	4700Ω		39374-33	BTS-4700	
R36	47Ω		39374-9	BTS-47	
R37	470Ω		39374-21		
R38	120K		39374-50	BTS-120K	
R39	120K		39374-50	BTS-120K	
R40	470Ω		39374-21	BTS-470	
R41	27Ω		39374-6	BTS-27	
R42	680Ω		39374-23	BTS-680	
R43	470Ω		39374-21	BTS-470	
R44	8200Ω	3	170773-4	PW4-8200	
R45	150Ω		39274-15	BTS-150	
R46	3900Ω		39374-32	BTS-3900	
R47	100K		39374-49	BTS-100K	
R48	15K		39374-39	BTS-15K	
R49	100K		39374-49	BTS-100K	
R50	100K		39374-49	BTS-100K	
R51	10Meg		39374-85	BTS-10Meg	
R52	3.3Meg		39374-73	BTS-3. 3Meg	
R53	15Ω		39374-3	BTS-15	
R54	10K		39374-37	BTS-10K	
R55	4700Ω	2		BTS-4700	
R56	3900Ω	2	39374-208	BTB-3900	
R57	1800Ω	1	39374-116	BTA-1800	
R58	680K			BTS-680K	Note 2
R59	390K			BTS-390K	Note 3
R60	120K		39374-50	BTS-120K	
R61	270K		39374-54	BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
R62	150K		39374-51	BTS-150K	
R63	47K		39374-45	BTS-47K	
R64	220K	1	39374-141	BTA-220K	
R65	15K		39374-39	BTS-15K	
R66	15K	1	39374-127	BTA-15K	
R67	120Ω		39374-14	BTS-120	
R68	1000Ω		39374-25	BTS-1000	
R69	1000Ω		39374-25	BTS-1000	
R70	220K		39374-53	BTS-220K	
R71	3900Ω	1	39374-120	BTA-3900	
R72	27K		39374-42	BTS-27K	
R73	56K		39374-46	BTS-56K	
R74	470K		39374-57	BTS-470K	
R75	330K		39374-55	BTS-330K	
R76	470Ω	1	39374-109	BTA-470	
R77	220Ω		39374-17	BTS-220	
R78	1200Ω	1	39374-114	BTA-1200	
R79	180K		39374-52	BTS-180K	
R80	68K		39374-37	BTS-68K	
R81	82K		39374-48	BTS-82K	
R82	1Meg		39374-61	BTS-1Meg	
R83	56K		39374-46	BTS-56K	
R84	2.2Meg		39374-69	BTS-2. 2Meg	
R85	680Ω		39374-23	BTS-680	
R86	5600Ω	3	170773-1		
R87	470K		39374-57	BTS-470K	
R88	68K		39374-37	BTS-68K	
R89	150K		39374-51	BTS-150K	
R90	680Ω		39374-23		
R91	680Ω		39374-23		
R92	1Meg		39374-61	BTS-1Meg	
R93	1Meg		39374-61	BTS-1Meg	
R94	10K		39374-37	BTS-10K	
R95	1Meg		39374-61	BTS-1Meg	
R96	100Ω		39374-13		
R97	27K		39374-42		
R98	47K		39374-45		
R99	10K	1	39374-125	BTA-10K	
R100	270Ω		39374-18	BTS-270	
R101	22K		39374-41		
R102	47K		39374-45	BTS-47K	
R103	100K		39374-49	BTS-100K	
R104	6800Ω		39374-35	BTS-6800	
R105	470K		39374-57	BTS-470K	
R106	100Ω		39374-13	BTS-100	
R107	22Ω	1	39374-5	BTA-22	
R108	6800Ω	3	170773-2		
R109	22K	1	39374-129	BTA-22K	
R110	4700Ω		39374-33	BTS-4700	
R111	1000Ω		39374-25	BTS-1000	Note 5
R112	33Ω	20	156230-6		
R113	7.5Ω	5	154089-1	FRT. 5-7. 5	
R114	33K	1	39374-131	BTA-33K	

Note 1: A 22K, 2W resistor (Part #39374-217) used in chassis 490.
Note 2: A 220K resistor, used in chassis 489 Code "C" and 490 Code "B".
Note 3: A 1Meg resistor(part #39374-61) used in chassis 489 Code "C" and 490 Code "B".
Note 4: A 47K resistor (part #39374-45 used in chassis 489 Code "A".
Note 5: A 1000Ω, 2W resistor used in chassis 490.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		CROSLEY PART No.	Halldorson PART No	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No
T1	Vert. Osc. Trans.	172249-1	B8704①②	A-3006①②		V406①③	A-8125①③	26A03①③	A-97X①③
T2	Horiz. Output Trans. Assembly	172287-2④							
T3	Vert. Output Trans.	158726-2	Z1807	A-2824		V315		26S76	A-112X
T4A	Yoke(90°)Horiz(22MH)	172388-1⑤	DF607⑥	MDF-92	235D1⑥	Y90F19/43	DY-16A	Y-16⑥	Y-41⑥ YC1
B	Vert(40MH)		⑦⑤	⑦⑥	⑦⑥	⑦⑥	⑤⑦⑥	⑦⑥	⑦⑥

① Drill new mounting hole(s).
③ Connect green lead to junction of capacitors C63 and C64; connect blue lead and black lead to ground; connect yellow lead to pin 7 of V11A and to output of vertical integrator network.
④ Connect green lead to junction of capacitors C63 and C64; connect blue lead and yellow lead to ground; connect red lead to pin 7 of V11A and to output of vertical integrator network.
⑤ Includes V16 tube socket.
⑥ Includes capacitor C89, Resistors R90 and R91. Does not includes yoke rear cover and centering device. (Crosley part #153586-1)
⑤ Use original rear cover and centering device.
⑦ Use original yoke damping network.
⑧ Jump yoke terminals #1 and #8.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	6600Ω	3-4Ω	172596-1	Z1113	A-2931	A-3878	24S52	S-51X	① Tape center tap on primary winding.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CROSLEY PART No.	QUAM PART No.	
SP1	5 1/4" 10"	PM PM	3-4Ω 3-4Ω	170385-1① 138762-5②	52A1 10A4A	① Used in models BT-12M, BT-12MZ, BT-12BZ, BT-13M, BT-13B. ② Used in models BC-12M, BC-12MZ, BC-12BZ, BC-13M, BC-13B, BC-14M, BC-15M.

COILS (RF-IF)

ITEM No.	USE	CROSLEY PART No.	NOTES
L1	Ant. Trans.	171799-100	
L2A	Ant., RF, Mixer Grid & Osc. Coils	171013-2	Channel 2
B	Ant., RF, Mixer Grid & Osc. Coils	171013-3	Channel 3
C	Ant., RF, Mixer Grid & Osc. Coils	171013-4	Channel 4
D	Ant., RF, Mixer Grid & Osc. Coils	171013-5	Channel 5
E	Ant., RF, Mixer Grid & Osc. Coils	171013-6	Channel 6
F	Ant., RF, Mixer Grid & Osc. Coils	171013-7	Channel 7
L2G	Ant., RF, Mixer Grid & Osc. Coils	171013-8	Channel 8
H	Ant., RF, Mixer Grid & Osc. Coils	171013-9	Channel 9
I	Ant., RF, Mixer Grid & Osc. Coils	171013-10	Channel 10
J	Ant., RF, Mixer Grid & Osc. Coils	171013-11	Channel 11
K	Ant., RF, Mixer Grid & Osc. Coils	171013-12	Channel 12
L	Ant., RF, Mixer Grid & Osc. Coils	171013-13	Channel 13

ITEM No.	USE	REPLACEMENT DATA				NOTES
		CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L3	1st Video IF	172560-1				Includes 39. 75MC and 47. 25MC traps.
L4	Fil. Choke	172348-1	19-1000			1.1 Microhenries.
L5	2nd Video IF	172299-1				Includes 47. 25MC trap.
L6	Fil. Choke	172348-1	19-1000			1.1 Microhenries
L7	3rd Video IF	172306-1				Includes 41. 25MC trap.
L8	Shunt Peaking Coil	172681-1	19-3160		6130	162 Microhenries
L9	Series Peaking Coil	172683-1	19-3093*	TV-181*	6177*	83 Microhenries; Wound on 6800Ω resistor.
L10A	4. 5MC Trap	172454-1				
B	1st Sound IF	172679-1	19-3125▲	TV-182	6113▲	113 Microhenries; Wound on 22K resistor.
L12	Shunt Peaking Coil	172680-1	19-3500	TV-188	6174	515 Microhenries
L13	Shunt Peaking Coil	172678-1	19-3036	TV-180	6176	40 Microhenries
L14	Series Peaking Coil	172682-1	19-3250■	TV-185■	6130■	273 Microhenries; Wound on 10K resistor.
L15	2nd Sound IF	172457-1				
L16	Quadrature Coil	172452-1				
L17	Fil. Choke	172348-1	19-1000			1.1 Microhenries
L18	RF Choke	159463-1	19-3093▲	TV-181▲	6177▲	96 Microhenries; Wound on 1000Ω resistor.
L19	Fil. Choke	159974-1	19-1001			1.3 Microhenries

* Parallel with 6800Ω resistor.
▲ Parallel with 22K resistor.
■ Parallel with 10K resistor.
▲ Parallel with 1000Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L20	140Ω		172339-1							Tap② 65Ω

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L21	. 270A	62Ω	1. 3H	155529-5	C5037①	C-3996①	C-2326①	26C44①	C-23X①	

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CROSLEY PART No.	REPLACEMENT DATA	
K1	Vertical Integrator	4700MMF, 4700MMF, 22K, 10K	170203-1①	Aerovox Centralab Sprague	PA-383-2 PC-106 V-5

① Alternate part #167812-1 used in chassis 489 Code "A" & "B", and in chassis 490 Code "B".

CROSLEY MODELS BC-12BZ, M, MZ, BC-13B, M, BC-14M, BC-15M, BT-12BZ, MZ, BT-13B, M (Ch. 489, 490)

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						
	CURRENT (Measured)	CROSLEY PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.270A	155575-1 ①	1023A ①	1N1007 ②	RS300SL ①	6S350 ①	6QA2 ①	350A ①
M2	.270A	155575-1 ①	1023A ①	1N1007 ②	RS300SL ①	6S350 ①	6QA2 ①	350A ①

① Selenium type.
② Germanium type.

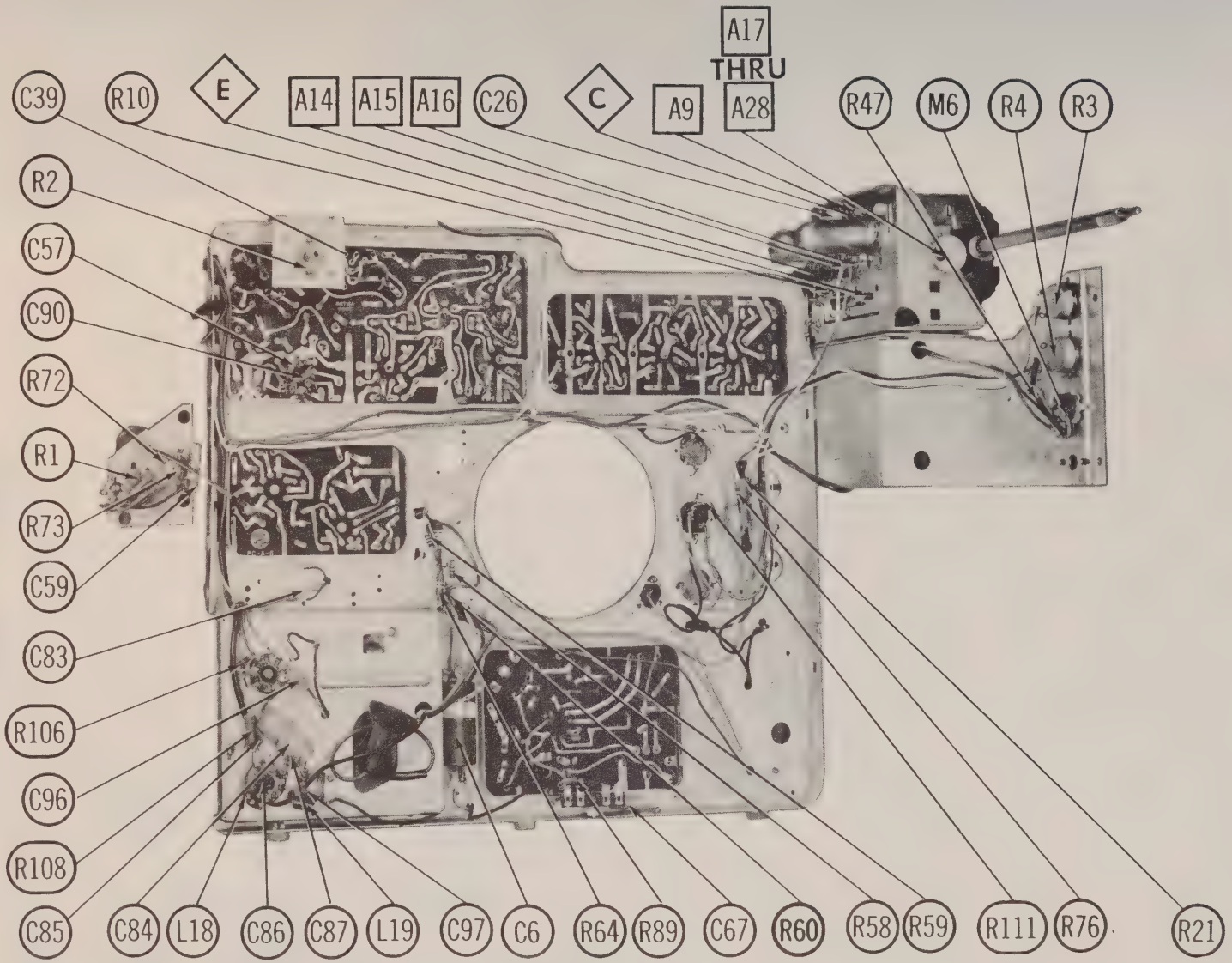
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		CROSLEY PART No.	SYLVANIA PART No.	
M3	1N295 ①	157465-5	1N60	Video Detector (Pigtail)

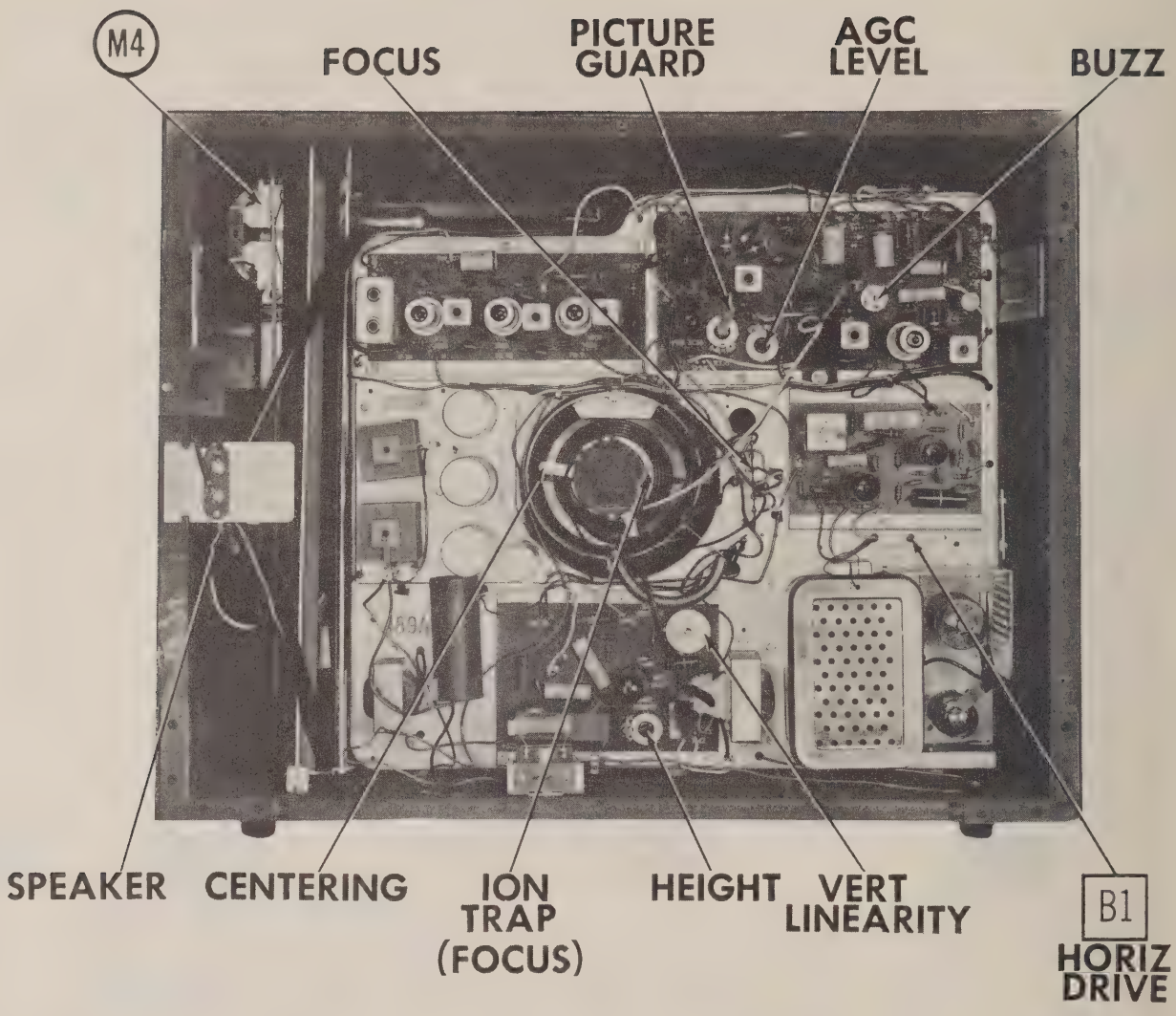
① CK706A may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M4	Tuner	172018-1	VHF, Used in chassis 489.
	Tuner	172417-1	UHF/VHF, Used in chassis 490.
M5	Crystal Det. Ass'y.	173346-1	Includes 4th Video IF, Coil,& Cap.
M6	Switch	172673-1	Local-Normal-Fringe (Rotary, Wafer Type)
M7	Centering Device	153586-1	Includes yoke rear cover.
M8	Ion Trap	153109-2	
	Printed Board	172242-1	Video IF
	Printed Board	172243-1	Picture
	Printed Board	172245-1	Horizontal
	Printed Board	172244-1	Vertical
	Glass	171562-2	All Models.
	Mask	171862-2	All Models.
	Knob	171910-1	UHF Channel Selector, All UHF Models.
	Knob	171735-2	UHF Fine Tuning, All UHF Models.
	Knob	171745-2	VHF Channel Selector, Models BT-13M, BT-13B, BC-13M, BC-13B, BC-15M.
	Knob	171912-1	VHF Channel Selector, Models BT-12M, BT-12MZ, BT-12BZ, BC-12M, BC-12MZ, BC-12BZ, BC-14M.
	Knob	171739-3	VHF Fine Tuning, All VHF Models.
	Knob	171739-4	Contrast, All Models.
	Knob	171911-1	On-Off Volume, All Models.
	Knob	171784-4	Local-Normal-Fringe, Models BT-13B, BT-12BZ, BC-13B, BC-12BZ.
	Knob	171784-2	Local-Normal-Fringe, Models BC-14M, BC-15M, BT-12M, BT-13M, BT-12MZ, BC-12M, BC-13M, BC-12MZ.
	Knob	171784-3	Brightness and Vertical Hold, Models BT-13B, BT-12BZ, BC-13B, BC-12BZ.
	Knob	171784-1	Brightness and Vertical Hold, Models BT-12M, BT-13M, BT-12MZ, BC-12M, BC-13M, BC-12MZ, BC-14M, BC-15M
	Cabinet	171816-1	Models BT-12M, BT-13M.
	Cabinet	171816-2	Model BT-13B.
	Cabinet	171816-3	Model BT-12MZ.
	Cabinet	171816-4	Model BT-12BZ.
	Cabinet	171881-1	Models BC-12M, BC-13M.
	Cabinet	171881-2	Model BC-13B.
	Cabinet	171881-3	Model BC-12MZ.
	Cabinet	171881-4	Model BC-12BZ.
	Cabinet	171880-1	Models BC-14M, BC-15M.



CHASSIS BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR

1. Tune in a TV station and adjust contrast and brightness controls for a normal picture.

2. Adjust the horizontal hold until the picture synchronizes horizontally.

3. Set the slug at the center of its lock-in range.

NOTE: If receiver fails to sync in, see AGC level adjustment below and repeat steps 2 and 3.

AGC LEVEL ADJUSTMENT USING SCOPE

1. Set contrast control and local fringe switch for normal operation, picture guard control fully counter clockwise.

2. Connect scope to point Ⓐ.

3. Adjust AGC level control for 3 volt peak to peak indication on scope.

AGC LEVEL FIELD ADJUSTMENT

1. Tune in strongest station in area and set local fringe switch to normal.

2. Set picture guard control maximum counter clockwise and contrast control maximum clockwise.

3. Rotate AGC level control maximum counter clockwise and note shaft position.

4. Slowly rotate control clockwise to the point where picture shows first sign of overload. Note position of shaft at this point and readjust control so shaft is 1/2 way between maximum counter clockwise and position of overload.

5. Check receiver on all channels. Correct setting is indicated by adequate contrast on weak stations while not overloading on the strongest stations.

6. Reset picture guard if necessary.

HORIZONTAL DRIVE

Adjust the horizontal drive trimmer (B1) for the widest picture without the presence of a vertical white line or compression near the center of the screen.

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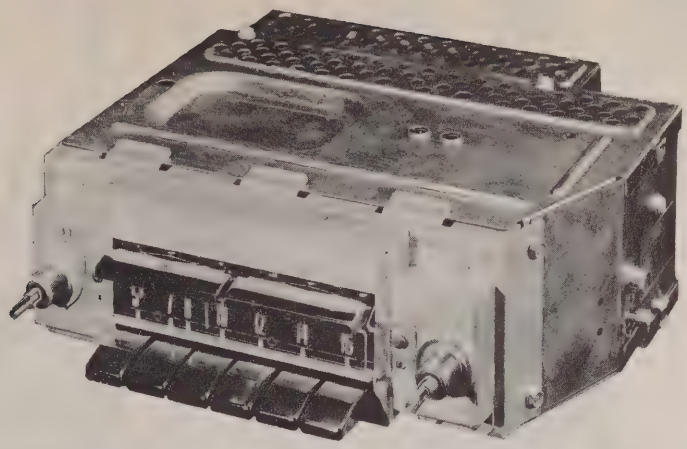

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DENVER, COLORADO

FORD MODEL
78MF (FEG-18806-G)

TRADE NAME	Ford Model 78MF (FEG-18806-G) (For 1957 Ford Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Eight)	Types 12AD6 RF Amplifier, 12AD6 Converter, 12AF6 1st IF Amplifier, 12AF6 2nd IF Amplifier, 12AJ6 Det-AF Amp., 12K5 Driver, 12AE6 Trigger-AVC, 12K5 Relay Control
POWER SUPPLY	12 Volt Storage Battery — RATING 2.3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control to treble.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400~ Mod)	High frequency end stop.	DC probe to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for MINIMUM deflection.
3.	Fig. 1	High side thru dummy to antenna receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	Adjust for maximum deflection.
	The following steps are not necessary except in case of tuner component replacement or if tuner has been tampered with. If necessary, back tuning cores out of coils 1 3/8" before proceeding with step 4. Repeat step 3.						
4.	Fig. 1	High side thru dummy to antenna receptacle. Low side to chassis.	1020KC	Back carriage 49/64" from high frequency end stop.	DC probe to point (A). Common to chassis.	A8, A9, A10	Adjust for maximum deflection. Use core alignment tool similar to Fig. 2.
5.	"	"	1610KC	High frequency end stop.	"	A5, A6, A7	Adjust for maximum deflection.
	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC, adjust A7 for maximum volume.						

POINTER CALIBRATION

If necessary, turn pointer adjusting cam, until pointer is centrally located on the 1000KC dial scale marking.

PUSHBUTTON ADJUSTMENT

1. Allow 15 minute warm-up period.
2. Unlock pushbuttons by pulling straight out.
3. Tune manually to desired station.
4. Press pushbutton in firmly.
5. Repeat on remaining pushbuttons.

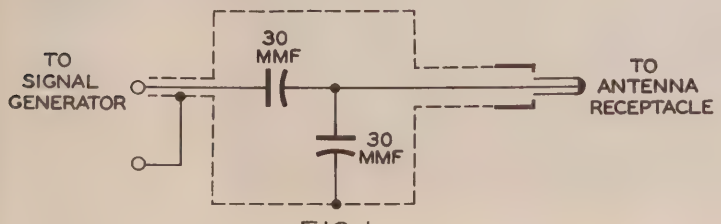

FIG. 1

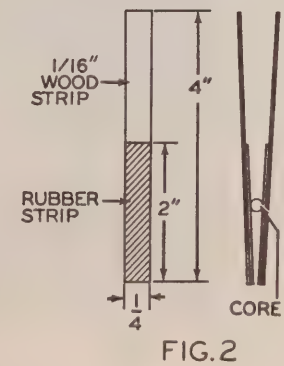

FIG. 2

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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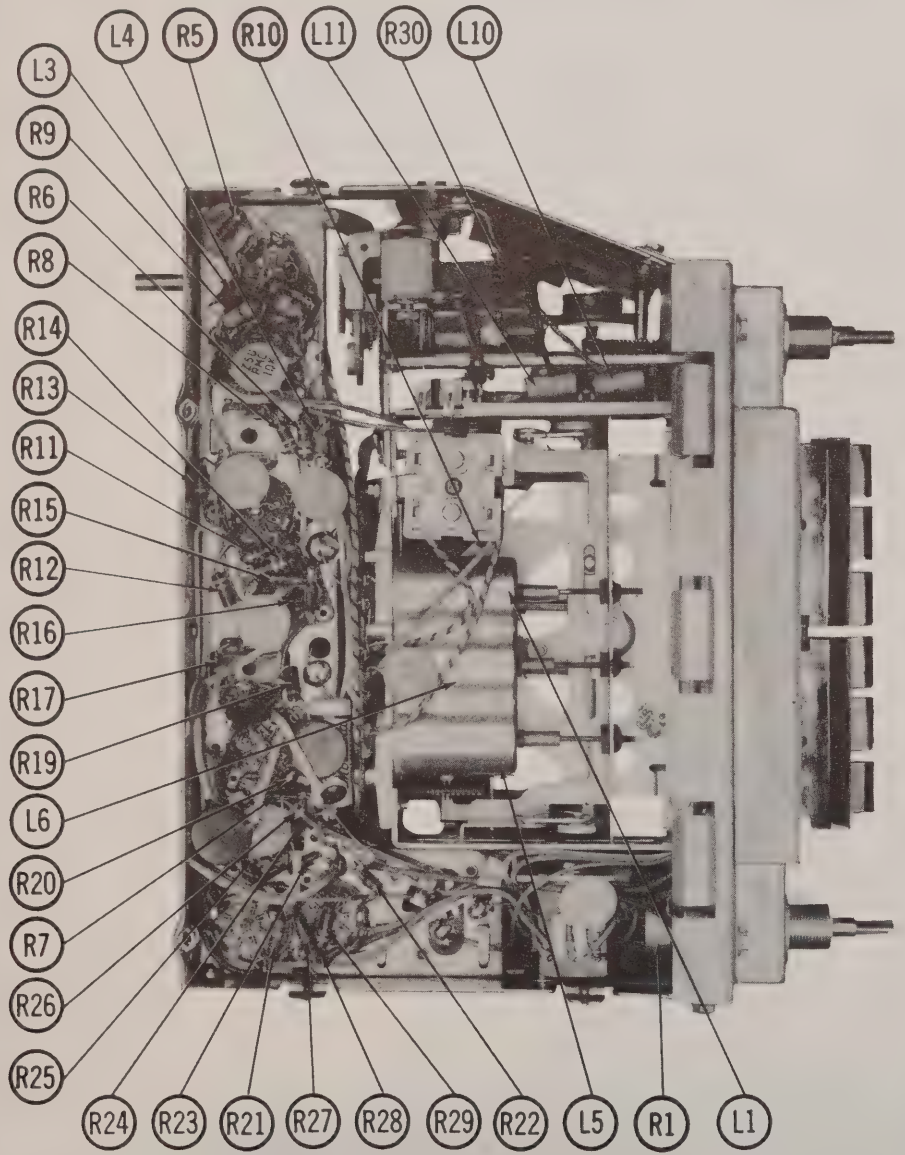
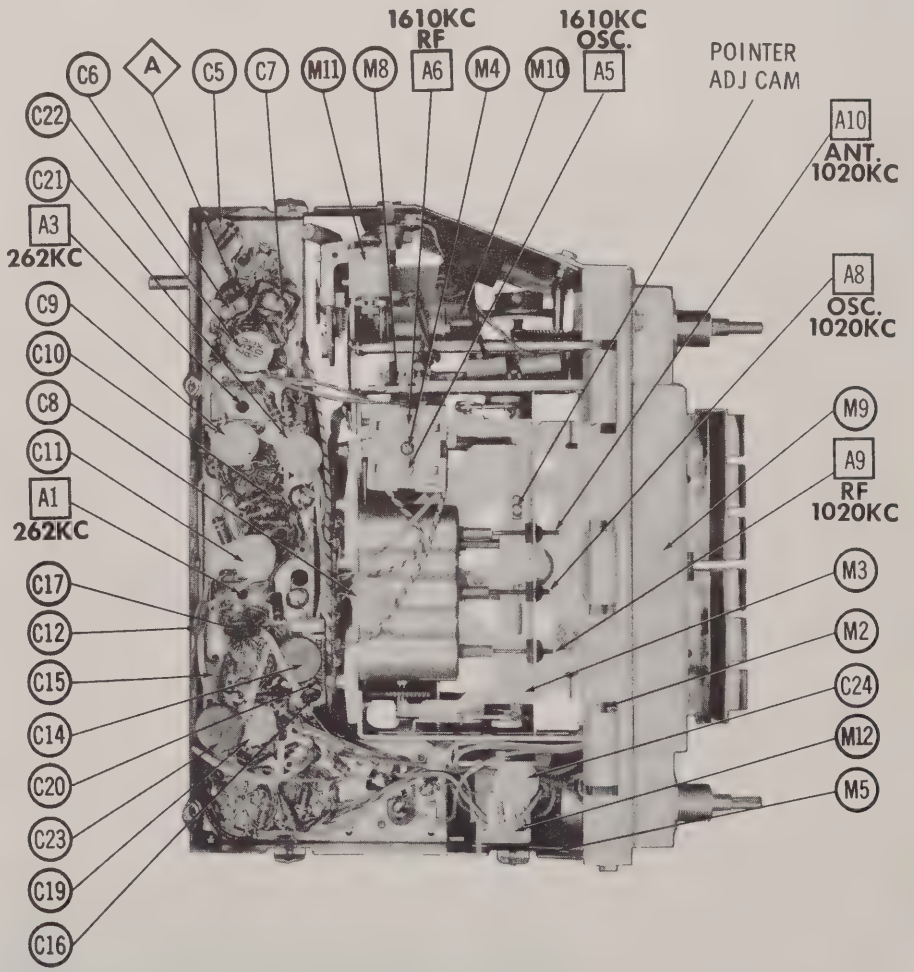
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AD6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12AF6	
V4	2nd IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V5	Det-AF Amplifier	12AJ6	
V6	Driver	12K5	
V7	Trigger-AVC	12AE6	
V8	Relay Control	12K5	

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Output	2N176	

ITEM No.	USE	TYPE	NOTES
X2	Output	2N176	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	500	16	23B537574						R2361*
B	100	16							
C2	500	3	23B539260	SRE3V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103
C3	500	3	23B539260	SRE3V500	BR500-6	TC605	TD-500-6	MTH-0650	TVA-1103

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	20-180		20K539683							
C5	10000		21R121946	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	33		21R120568	BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C7	800		21K540465	BPD-0008	D6-800	L10T8	ED-800		5GA-T8	
C8	100		21R124032							
C9	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	220		21K121698	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C11	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	100		21R410036	N750-S1 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C13	39		21R120569	BPD-000039	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C14	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	100		21R120576	S1 100	D6-101	L10T1	ED-100	UC-531	5GA-T1	
C16	150		21R400932	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C17	51			N750-S1 51	TCN-51	C10Q51U	TC7-51			Note 1
C18	.02	200	8R121003	BPD-02	DD-203	CUB2S2	ED-02	GEM-412	2TM-S2	
C19	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C20	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C21	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C22	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	Note 2
C24	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

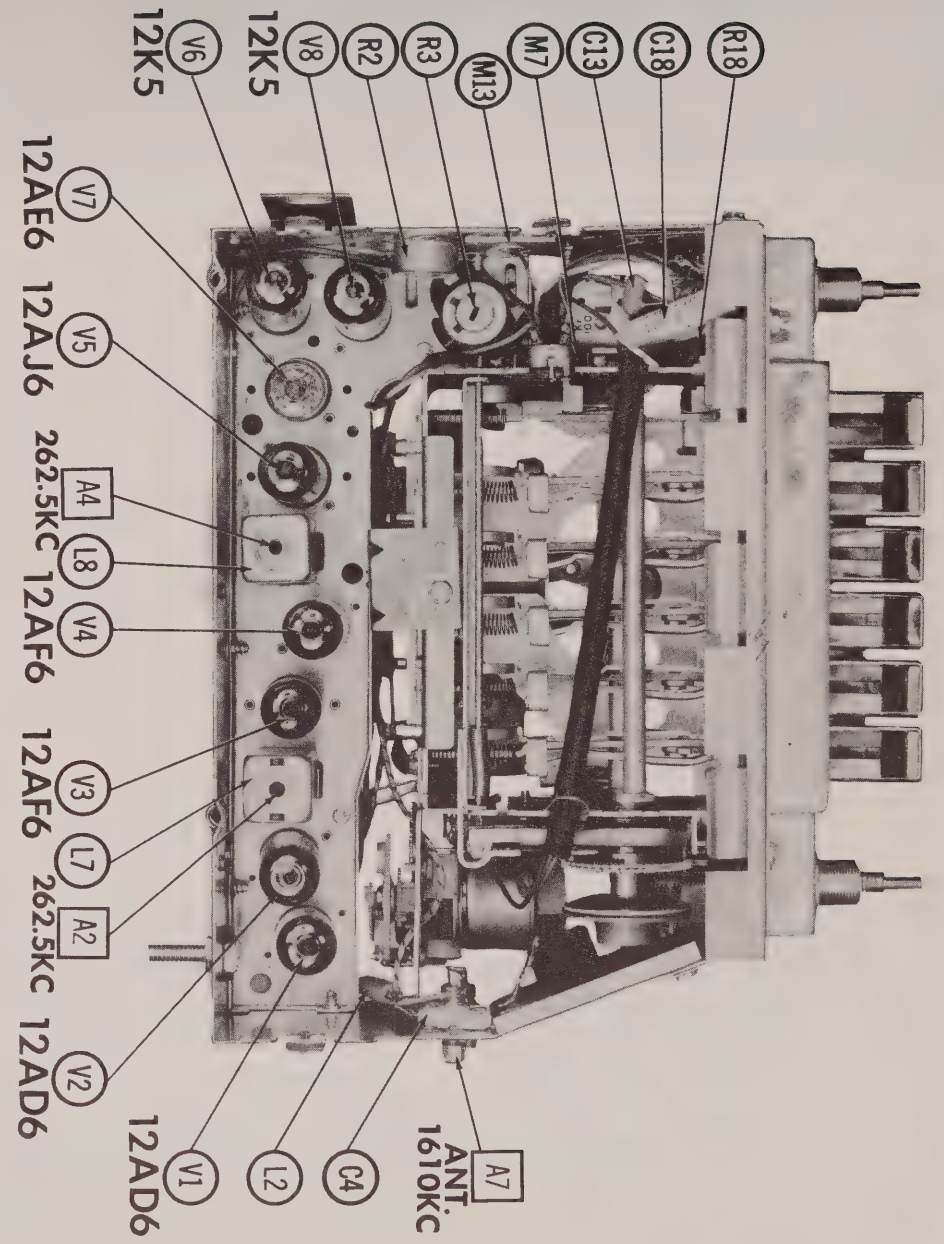
Note 1: Some versions use 47MMF in this application. (Part #21R115593)
Note 2: Some versions use 20000MMF in this application. (Part #21R120040)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4Meg	½	18B539379	F1-82	RTV-618C	♦QJ-1033A	UE-3255	Tone
B	1Meg	½		R2-59				Volume, Tap② 300K
R2	2000Ω	1	18K520298		39-2000-100		FL-2KS	Sensitivity, Normal
R3	1000Ω	1	18K539684					Sensitivity, Town
R4	125Ω	1	18K591265		39-125		FL-150	Bias

♦ Concentrikit equivalent: Kit K-6, Base Elements & Shafts: B12-141 & P13-116 (Panel)
B13-137X & R1-200 (Rear)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	24C536308				Part of tuner M3.
L2	Ant. Loading Coil	24A532148	19-6033			31 Microhenries
L3	IF Trap	24C539614	19-3180	TV-184	6180	173 Microhenries
L4	IF Trap	24K539615				30 Microhenries
L5	RF Coil	24C536308				Part of tuner M3.
L6	Osc. Coil	24B536300				Part of tuner M3.
L7	Input IF	24B536693	16-6752	BC-350	12-H1	
L8	Output IF	24B533073				
L9	Fil. Choke	24K539382				125 Microhenries
L10	Search Motor Hash Choke	24A535789				3 Microhenries. Part of tuner M3.
L11	Search Motor Hash Choke	24A535789				3 Microhenries. Part of tuner M3.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L12	2. 3A	. 65Ω	5. 4 Millihenries	25K539590					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	7AG	7. 5A 32V	65R122346	9K539682	30307. 5 (7AG-7. 5A)	155009	SFE 7 1/2	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Dial Light	65T533821	12V, #1891
M3	Tuner	77K539508	Complete Ass'y.
M4	Trimmer Cap.	20B539612	3 Section Mica (50-260MMF, 120-220MMF, 47MMF)
M5	Spark Plate	64K530177	
M6	Spark Plate	64A530176	
M7	Switch	40A536283	On-Off
M8	Switch	40B535396	Motor Reversing
M9	Switch	1V539309	Search Selector, Includes Buttons and Sensitivity Switch.
M10	Motor	59C535466	Tuner Drive

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M11	Solenoid	59A537563	
M12	Relay	1V540128	
M13	Spark Plate	48A539147	Selenium Type. (Use Mtg. Bushing #43A539289, Mtg. Eyelet #5K124638; Washer #4A540423
(or)			
M13	Spark Plate	48K539953	Selenium Type. (Use Mtg. Bushing #43A539954, Mtg. Eyelet #5K124848).
	Glass	34C539063	Dial
	Cover	15K539596	Bottom
	Cover	15C539071	Top
	Knob	36B539476	Tone and Dummy
	Knob	36B539472	Volume and Tuning
	Pushbutton	1K539243	On-Off
	Pushbutton	1B539242	5 Used

ADJUSTMENTS

SENSITIVITY ADJUSTMENTS

NORMAL (R2)

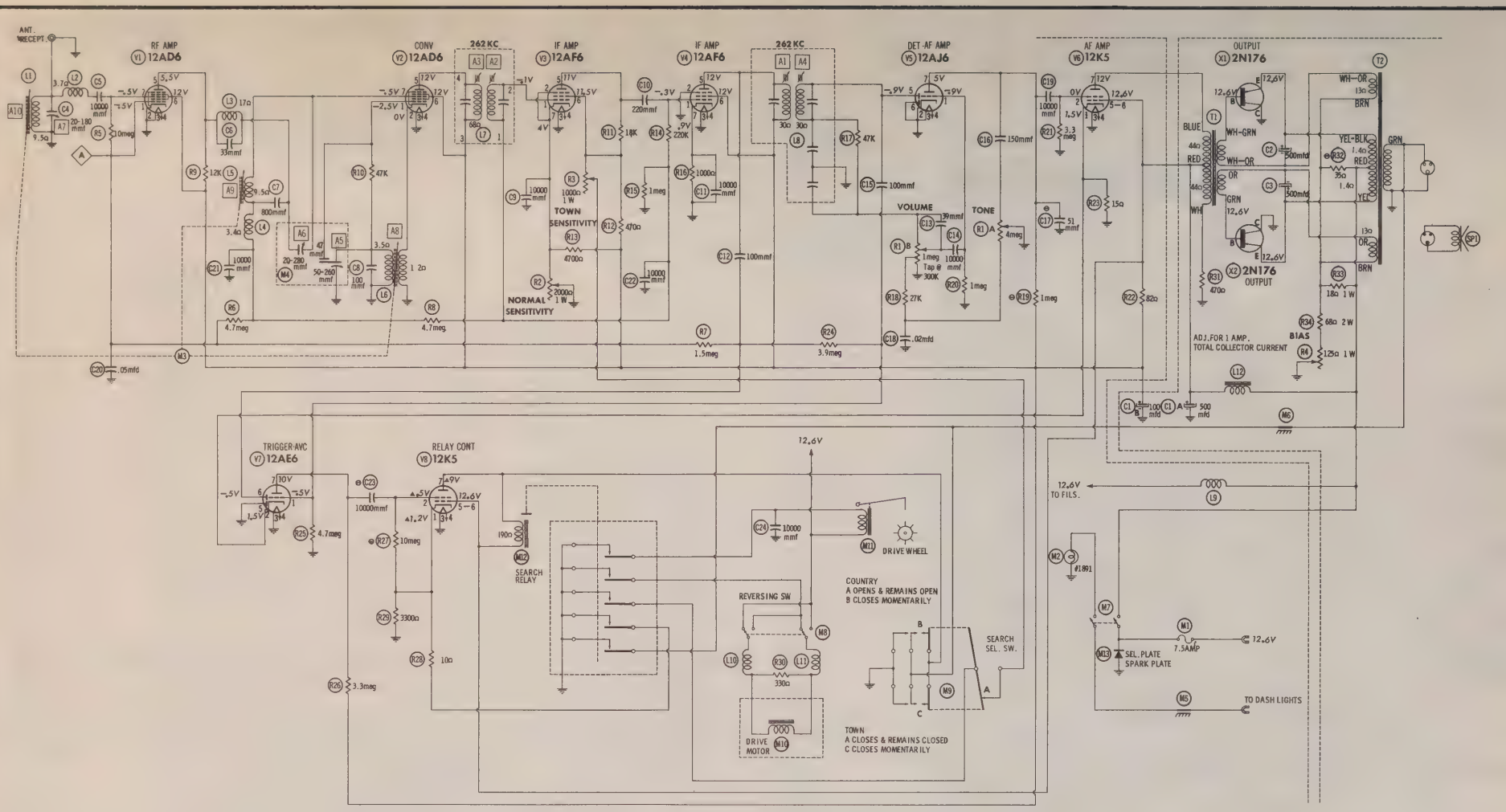
With output meter connected across voice coil and volume control at maximum, tune receiver for maximum noise output. Connect a signal generator adjusted to 1000KC at 5 microvolts to the antenna receptacle thru dummy antenna (refer alignment Fig. 1). Adjust R2 for a reading of 1. 79 volts on output meter.

TOWN (R3)

With output meter connected across voice coil and volume control at maximum, tune receiver for maximum noise output. Connect a signal generator adjusted to 1000KC at 100 microvolts to the antenna receptacle thru dummy antenna (refer alignment Fig. 1). Short case of R3 to chassis. Adjust R3 for a reading of 1. 79 volts on output meter.

BIAS ADJUSTMENT (R4)

Separate the transistor mounting heat sink from the housing. Connect the positive lead of a low resistance milliammeter (.5Ω max.) to the heat sink and the negative lead to the receiver chassis. With a power source of 12 volts DC connected to the receiver, adjust R4 for a reading of 870MA on the milliammeter.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AD6	5Meg	0Ω	0Ω	1.4Ω	†12K	†82Ω	15Meg
V2	12AD6	47K	1.2Ω	0Ω	1.4Ω	†150Ω	†82Ω	4.3Meg
V3	12AF6	1Meg	1400Ω	0Ω	1.4Ω	†18K	†550Ω	1400Ω
V4	12AF6	1.2Meg	0Ω	0Ω	1.4Ω	†110Ω	†82Ω	1000Ω
V5	12AJ6	1Meg	0Ω	0Ω	1.4Ω	800K	0Ω	†1Meg
V6	12K5	15Ω	3.3Meg	0Ω	1.4Ω	†.6Ω	†.6Ω	†44Ω
V7	12AE6	3.8Meg	15Ω	0Ω	1.4Ω	0Ω	4.6Meg	†3.3Meg
V8	12K5	▲ 10Ω 3300Ω	10Meg	0Ω	1.4Ω	†.6Ω	†.6Ω	▲ 0Ω †190Ω
		BASE	EMITTER	COLLECTOR				
X1	2N176	4Ω	25Ω 7Ω	0Ω				
X2	2N176	4Ω	25Ω 7Ω	0Ω				

† MEASURED FROM JUNCTION OF L12 AND R33
▲ MEASURED WITH SEARCH RELAY (M12) ACTIVATED

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

◉ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R5	10Meg		6R5622	BTS-10Meg	
R6	4.7Meg		6R6446	BTS-4.7Meg	
R7	1.5Meg		6R3966	BTS-1.5Meg	
R8	4.7Meg		6R6446	BTS-4.7Meg	
R9	12K		6R6394	BTS-12K	
R10	47K		6R6056	BTS-47K	
R11	18K		6R5591	BTS-18K	
R12	470Ω		6R3949	BTS-470	
R13	4700Ω		6R6080	BTS-4700	
R14	220K		6R6407	BTS-220K	
R15	1Meg		6R6046	BTS-1Meg	
R16	1000Ω		6R6229	BTS-1000	
R17	47K		6R6056	BTS-47K	
R18	27K		6R6434	BTS-27K	
R19	1Meg		6R5046	BTS-1Meg	Note 1
R20	1Meg		6R6046	BTS-1Meg	
R21	3.3Meg		6R2118	BTS-3.3Meg	
R22	82Ω		6R2035	BTS-82	
R23	15Ω		6R2034	BTS-15	
R24	3.9Meg		6R490110	BTS-3.9Meg	
R25	4.7Meg		6R6446	BTS-4.7Meg	
R26	3.3Meg		6R2118	BTS-3.3Meg	
R27	10Meg		6R5622	BTS-10Meg	Note 2
R28	10Ω		6R5621	BTS-10	
R29	3300Ω		6R6036	BTS-3300	
R30	330Ω		6R6010	BTS-330	
R31	470Ω		6R6090	BTS-470	
R32			6A539409		Note 3
R33	18Ω	1	6R118228	BTA-18	
R34	68Ω	2	6R118239		

Note 1: 4.7Meg may be used in some versions. (Part #6R6446)
Note 2: 3.3Meg may be used in some versions (Part #6R6497)
Note 3: Special temperature compensation type, 35Ω @ 25°C.

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio	REPLACEMENT DATA						NOTES
	PRI. SEC.1	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	13 : 1	25B539327						
	PRI. SEC.2							
	13 : 1							

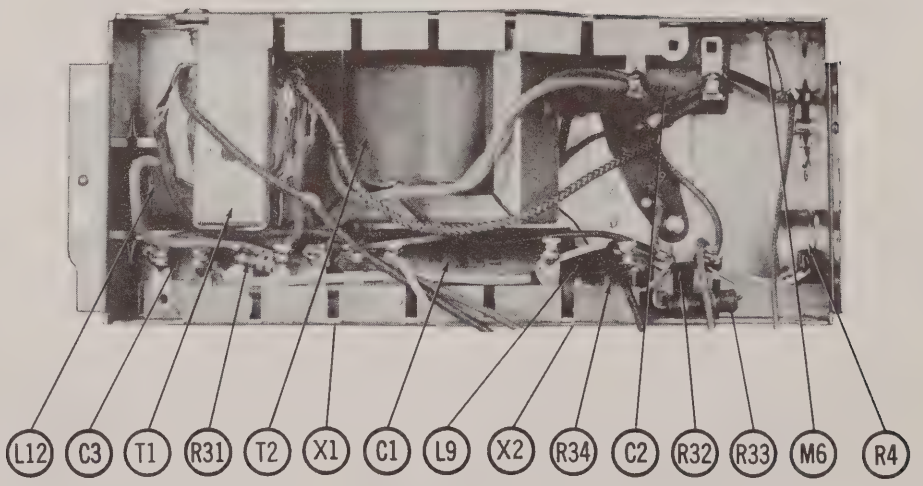
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	33Ω CT	3-4Ω	25B539328						
	Turns Ratio								
	1 : .5 (Sec. 2)								
	1 : .5 (Sec. 3)								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" X 9"	PM	3-4Ω	50D538018	69A2	

POWER CHASSIS—BOTTOM VIEW



KNIGHT
MODEL 93SZ690

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

KNIGHT
MODEL 93SZ690

KNIGHT
MODEL 93SZ690

TRADE NAME	Knight Model 93SZ690
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.
TYPE SET	AC Operated 2 Channel 8 Watt Audio Amplifier
TUBES (Three)	Types 6SL7GT AF Amplifier, 6L6G Output, 5Y3GT Rectifier
POWER SUPPLY	110-130 Volts AC - 60 Cycles RATING .7 Amp. @ 117 Volts AC (70 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

KNIGHT MODEL 93SZ690

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6SL7GT	
V2	Output	6L6G	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH4-17	DO160	FP475.5	TMQ-17	Q-055	TVL-4771.3
B	10	450							
D	▲10	450							
D	■10	450							
C2A	40	25		PRS150V4040	BR502	TC29	TD-50-25	FM-0250	TVA-1206
B	40	25			BR502	TC29	TD-50-25	FM-0250	TVA-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C4	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C5	100	500		1468-0001	DD-101	G042	ED-100	MC235	1FM-31	
C6	.0047	600		BPD-0047	DD-472	CUB6D47	ED-0047	GEM-6247	6TM-D47	
C7	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C8	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Mic. Control
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Phono Control
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R3A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

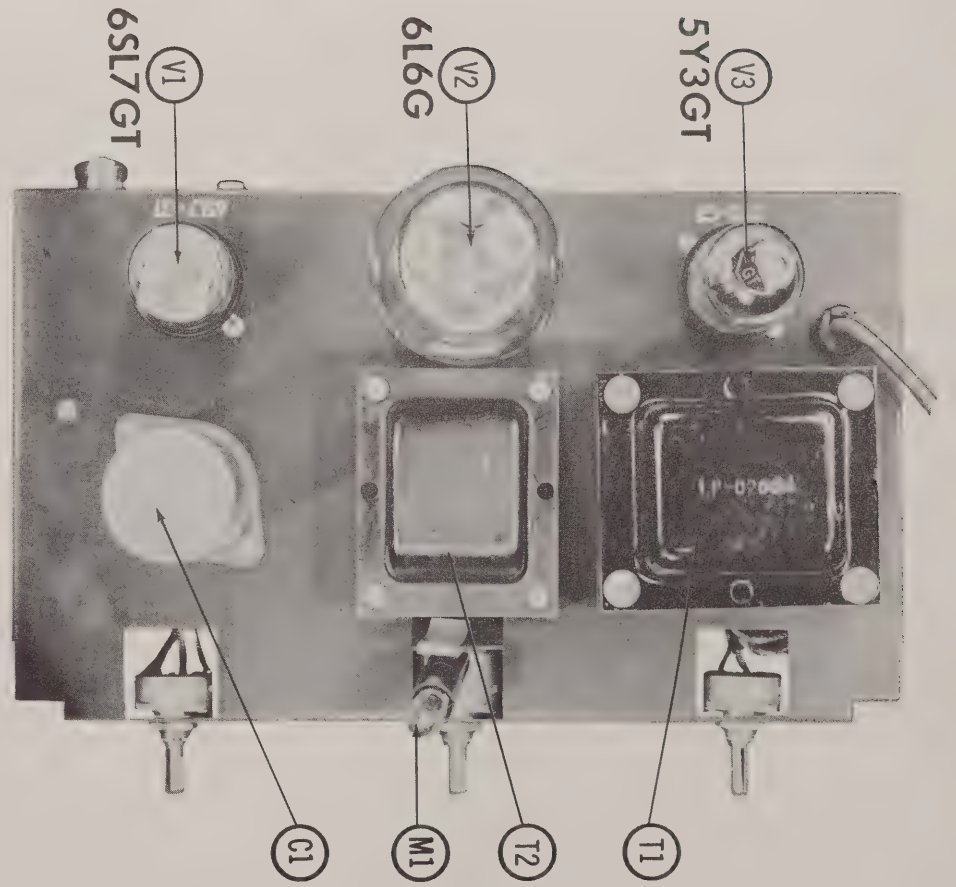
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA KNIGHT PART No.	IRC PART No.	NOTES
R4	10Meg			BTS-10Meg	
R5	470K			BTS-470K	
R6	100K			BTS-100K	
R7	470K			BTS-470K	
R8	2700Ω			BTS-2700	
R9	220K			BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA KNIGHT PART No.	IRC PART No.	NOTES
R10	470K			BTS-470K	
R11	250Ω	10		PW10-250	
R12	47K			BTS-47K	
R13	10K	1		BTA-10K	
R14	600Ω	10		1 3/4A-600	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	130VAC Tap ⓐ 117VAC ⓐ . 7A	720VCT ⓐ . 077A	5VAC ⓐ 2A	6. 3VCT ⓐ 1. 4A	LP-0208				22R31 ①	

① This transformer does not provide a tap on primary winding for 130VAC input. Mount with original shield.

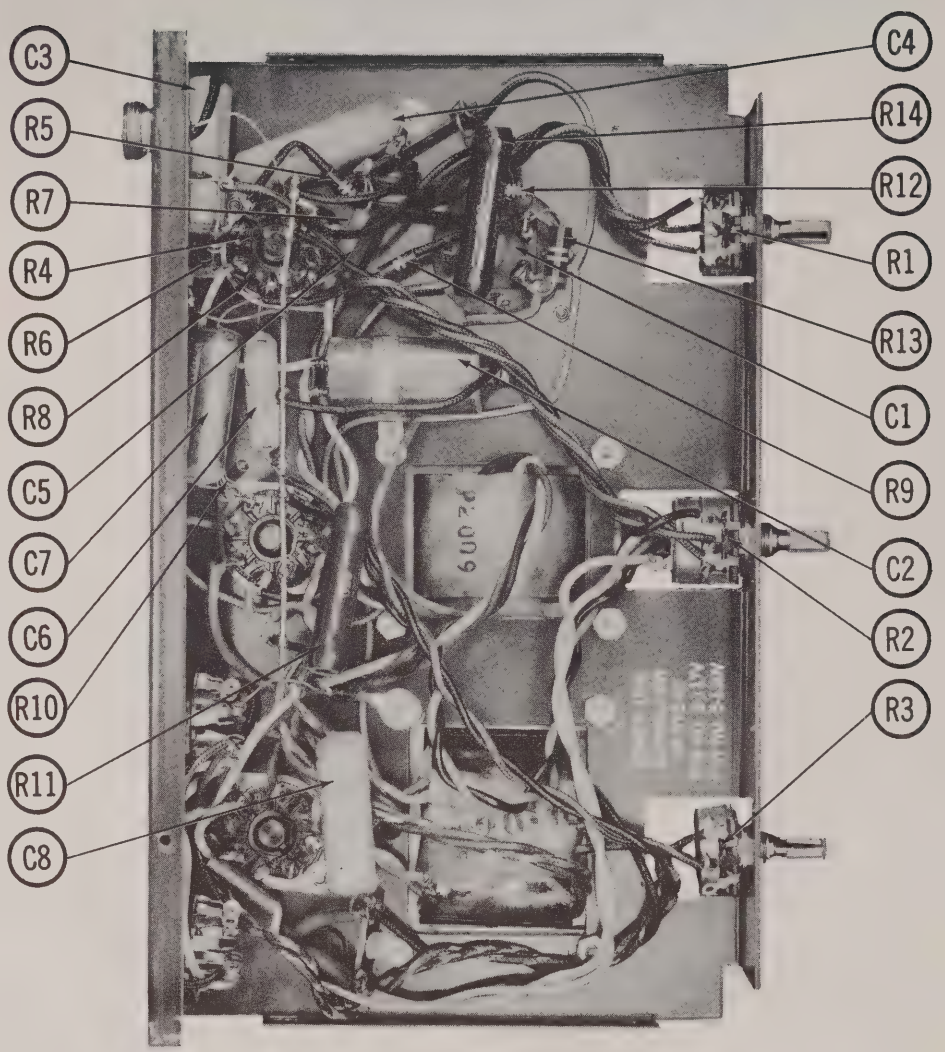
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5600Ω	8Ω tap ⓐ 4Ω	LO-0118						

MISCELLANEOUS

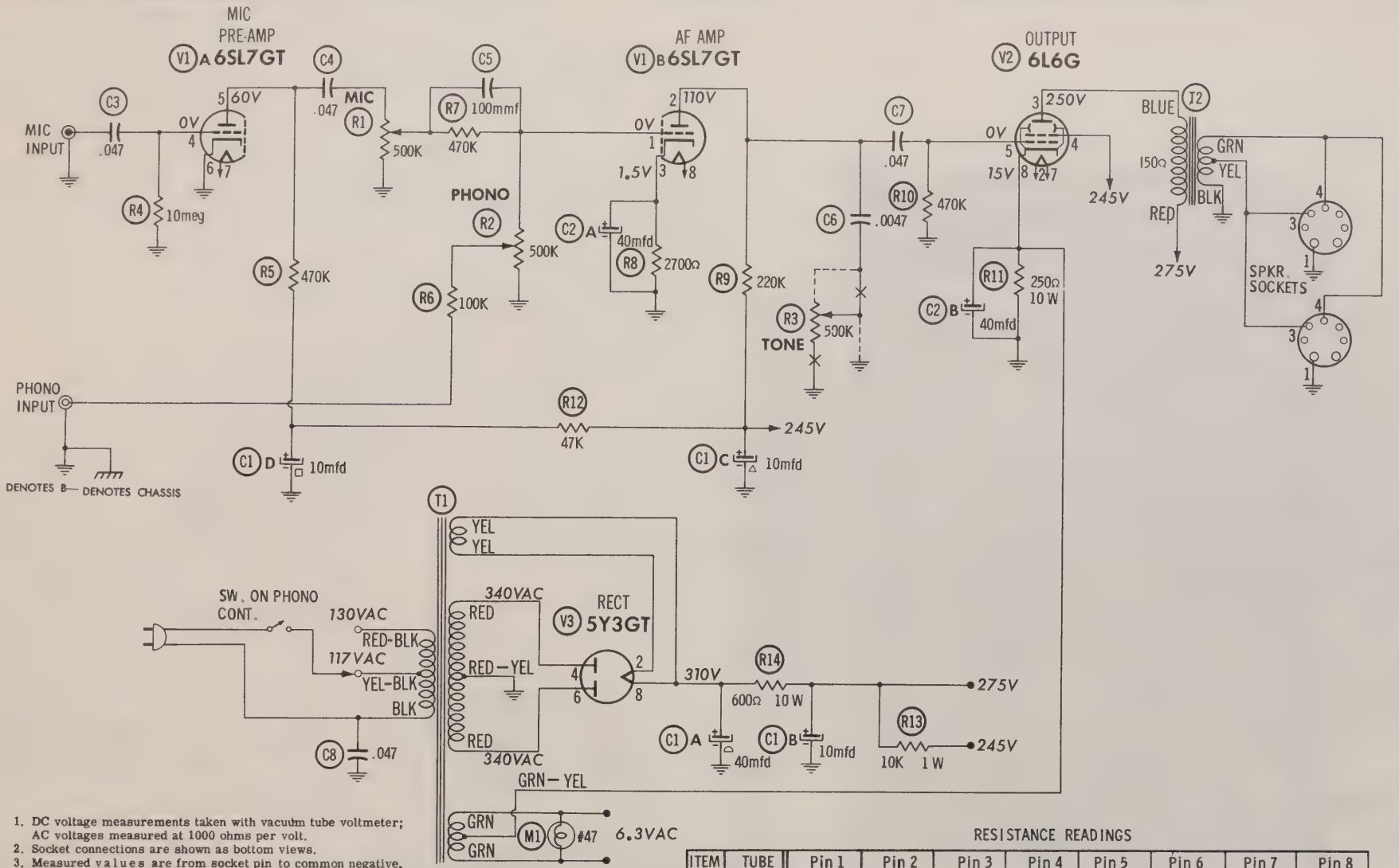
ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Pilot Light		#47

CHASSIS—BOTTOM VIEW



KNIGHT MODEL 93SZ690

KNIGHT MODEL 93SZ690



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6SL7GT	330K	†230K	2700Ω	10Meg	†530K	0Ω	250Ω	250Ω
V2	6L6G	INF	250Ω	†750Ω	†10K	470K	TP	250Ω	250Ω
V3	5Y3GT	NC	30K	TP	200Ω	TP	220Ω	NC	30K

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

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KNIGHT
MODELS 94SX702, 94XS711

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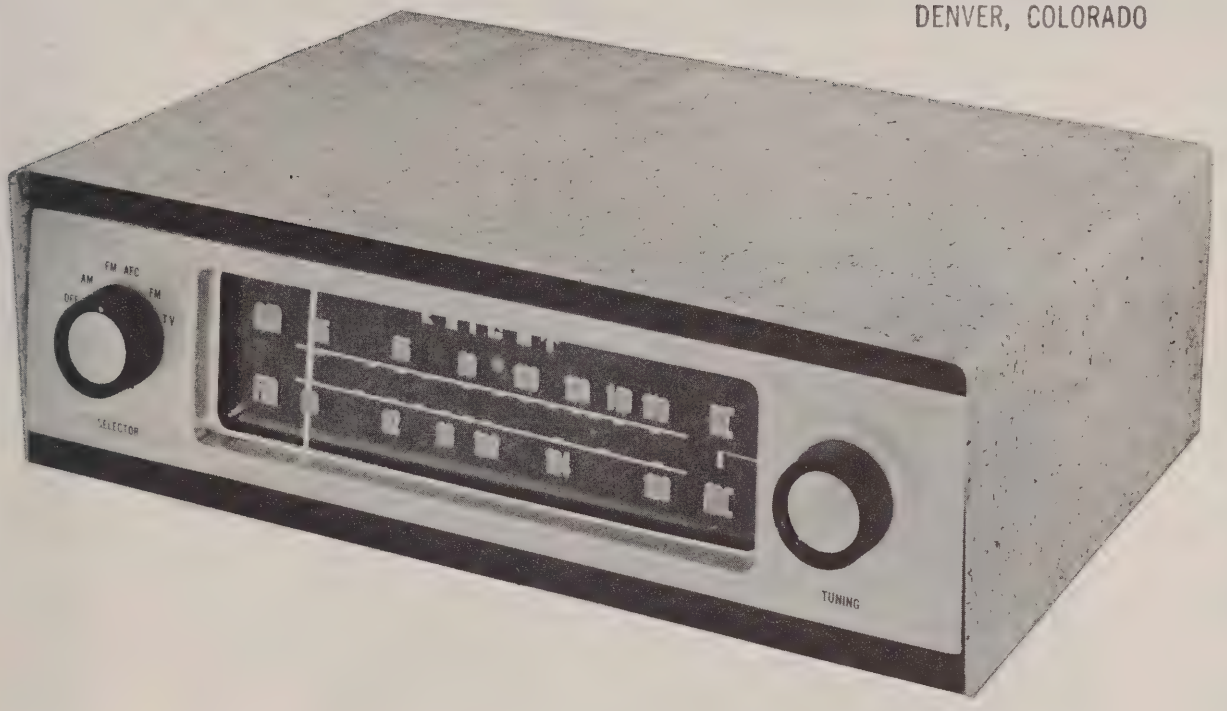
KNIGHT
MODELS 94SX702, 94XS711

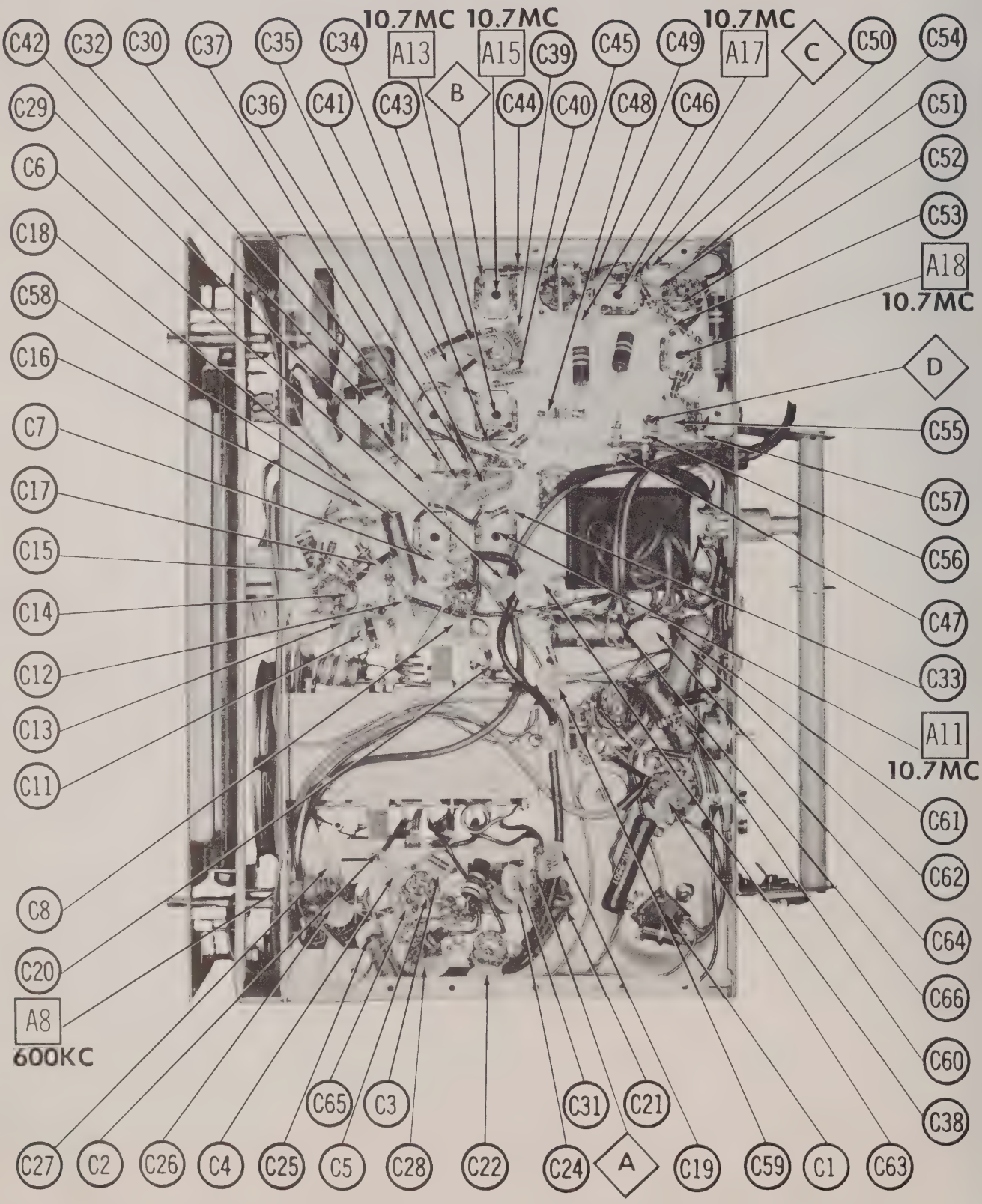


KNIGHT
MODELS 94SX702, 94XS711

TRADE NAME	Knight Models 94SX702, 94SX711		
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.		
TYPE SET	AC Operated FM-AM Tuner		
TUBES	Twelve		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.5 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	550KC-1630KC	FREQ. MOD.	88MC-108MC

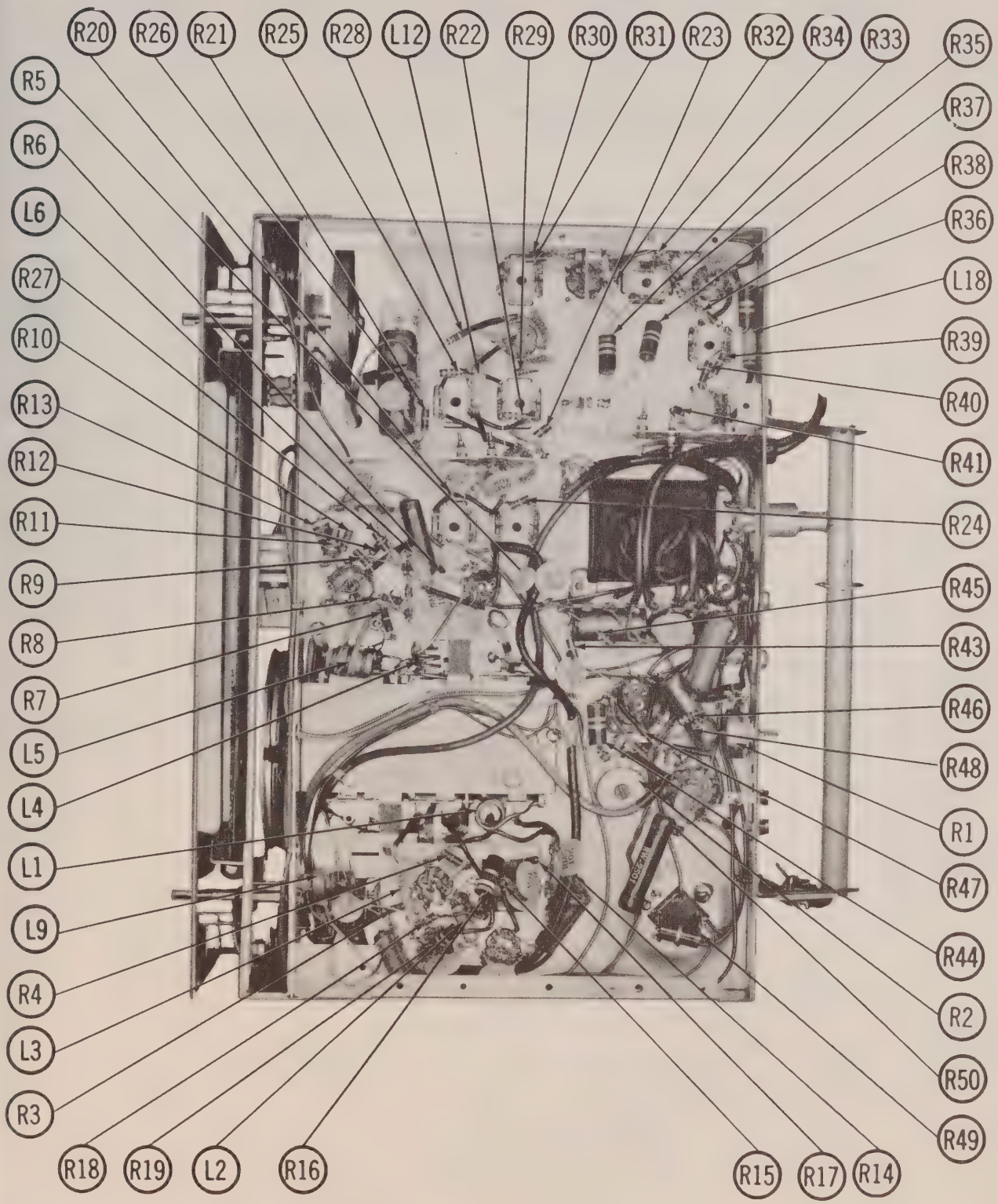
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

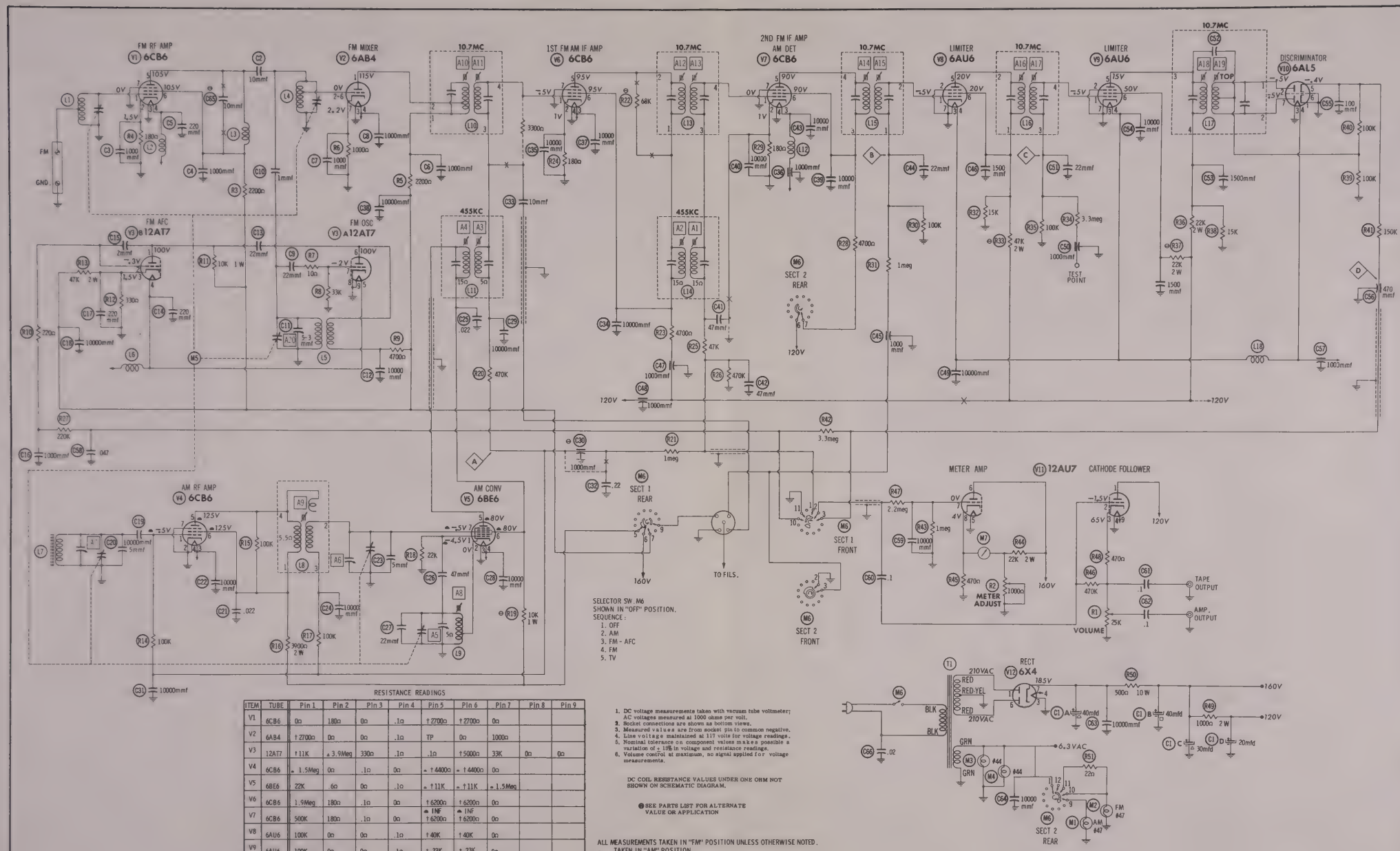


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	0Ω	180Ω	0Ω	.1Ω	†2700Ω	†2700Ω	0Ω		
V2	6AB4	†2700Ω	0Ω	0Ω	.1Ω	TP	0Ω	1000Ω		
V3	12AT7	†11K	▲3.9Meg	330Ω	.1Ω	.1Ω	†5000Ω	33K	0Ω	0Ω
V4	6CB6	▲1.5Meg	0Ω	.1Ω	0Ω	▲†4400Ω	▲†4400Ω	0Ω		
V5	6BE6	22K	.6Ω	0Ω	.1Ω	▲†11K	▲†11K	▲1.5Meg		
V6	6CB6	1.9Meg	180Ω	.1Ω	0Ω	†6200Ω	†6200Ω	0Ω		
V7	6CB6	500K	180Ω	.1Ω	0Ω	▲INF †6200Ω	▲INF †6200Ω	0Ω		
V8	6AU6	100K	0Ω	0Ω	.1Ω	†40K	†40K	0Ω		
V9	6AU6	100K	0Ω	0Ω	.1Ω	†23K	†23K	0Ω		
V10	6AL5	0Ω	100K	0Ω	.1Ω	200K	0Ω	100K		
V11	12AU7	†1500Ω	500K	25K	0Ω	0Ω	†500Ω	700K	470Ω	.1Ω
V12	6X4	110Ω	NC	0Ω	.1Ω	NC	110Ω	20K		

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE NOTED.
▲ TAKEN IN "AM" POSITION.
† MEASURED FROM PIN 7 OF V12.
△ MEASURED IN "FM-AFC" POSITION.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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352-8

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (400∿Mod)	AM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	270Ω Carbon Resistor	High side thru 270Ω to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5	"
3.	"	"	1500KC	"	Tune to 1500KC signal	"	A6, A7	"
4.	"	"	600KC	"	600KC	"	A8	"
5.	"	"	600KC	"	Tune to 600KC signal	"	A9	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12, A13, A14, A15	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A16, A17	"
8.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A18	"
9.	"	"	"	"	"	"	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
10.	"	"	10.725MC 10.675MC	"	"	"	A18	Vary generator frequency 25KC above and below 10.7MC. Meter deflection should be nearly equal above and below 10.7MC. If necessary, retouch A10 thru A17 until nearly equal meter deflections above and below 10.7MC are obtained.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A10, A11, A12, A13, A14, A15	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A16, A17	"
8.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A18	"
9.	"	"	"	"	"	"	A19	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines. Proceed with alignment in step 11.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC	FM	108MC	DC probe to point Ⓑ. Common to chassis.	A20, L5	Adjust for maximum deflection. (L5 is adjusted by compressing or expanding coil turns).
12.	"	"	88MC	"	88MC	"	L1, L4	Adjust for maximum deflection by compressing or expanding coil turns.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6	
V2	FM Mixer	6AB4	
V3	FM Osc. -AFC	12AT7	
V4	AM RF Amplifier	6CB6	
V5	AM Converter	6BE6	
V6	1st. IF Amplifier	6CB6	
V7	2nd. FM IF Amp. - AM Det. -AVC	6CB6	
V8	1st. Limiter	6AU6	
V9	2nd. Limiter	6AU6	
V10	Discriminator	6AL5	
V11	Meter Amp. -Cath. Follower	12AU7	
V12	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300				FP235	TMQ-3	D-130	R2366 *
B	■40	300				TC78	TD-20-350	MTD-2520	
C	▲30	250							
D	20	200							

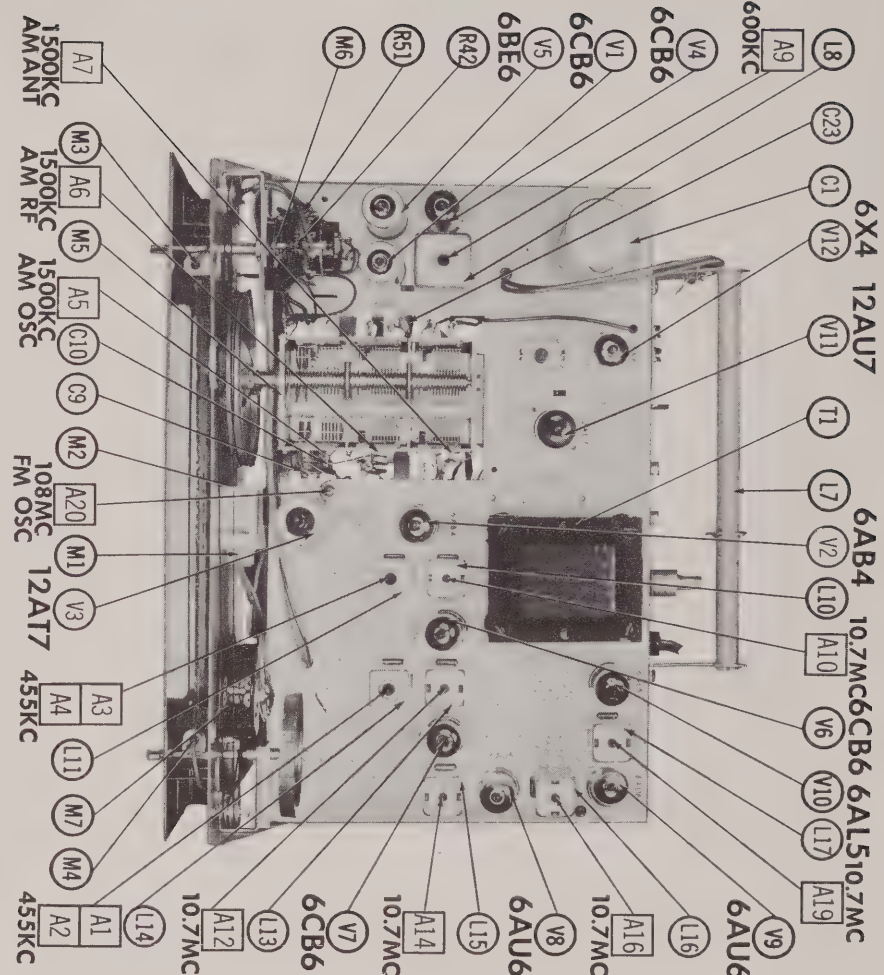
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10			NP0-SI 10	TCZ-10	Z018	TCO-10	ZT-541	5TCC-Q1	
C3	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C4	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C5	220			DI-220	DD-221	G051	ED-220	UC-5322	5GA-T22	
C6	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C7	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C8	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C9	22			NP0-SI 22	TCZ-22	Z024	TCO-22		5TCC-Q22	
C10	1			NP0-SI 1	TCZ-1	C10V1C	TCO-1		5TCCB-V1	
C11	.5-3				829-3		3115-D	CT565A		
C12	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C13	22			NP0-SI 22	TCZ-22	Z024	TCO-22		5TCC-Q22	
C14	220			DI-220	DD-221	G051	ED-220	UC-5322	5GA-T22	
C15	2			NP0-SI 2.2	TCZ-2R2	Z005				
C16	1000			BPD-001	DD-102	K069	ED-001	DC521	5HK-D1	
C17	220			DI-220	DD-221	G051	ED-220	UC-5322	5GA-T22	
C18	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C19	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C20	5			NP0-SI 5	TCZ-4R7	Z011	TCO-5	ZT-555	5TCCB-V47	
C21	.022	200		BPD-02	DD-203	CUB2S22	ED-02	GEM-4122	2TM-S22	
C22	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C23	5			NP0-SI 5	TCZ-4R7	Z011	TCO-5	ZT-555	5TCCB-V47	
C24	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C25	.022	200		BPD-02	DD-203	CUB2S22	ED-02	GEM-4122	2TM-S22	
C26	47			NP0-SI 47	TCZ-47	Z033	TCO-47		5TCC-Q47	
C27	22			NP0-SI 22	TCZ-22	Z024	TCO-22		5TCC-Q22	
C28	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C29	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C30	1000			EF-001	MFT-1000				503C-D1	
C31	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C32	.22	200		P288N-22		CUB2S22		GEM-4022	2TM-P22	
C33	10			NP0-SI 10	TCZ-10	Z018	TCO-10	ZT-541	5TCC-Q1	
C34	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C35	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C36	1000			EF-001	MFT-1000				503C-D1	
C37	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C38	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C39	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C40	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C41	47			NP0-SI 47	TCZ-47	Z033	TCO-47		5TCC-Q47	
C42	47			NP0-SI 47	TCZ-47	Z033	TCO-47		5TCC-Q47	
C43	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C44	22			NP0-SI 22	TCZ-22	Z024	TCO-22		5TCC-Q22	
C45	1000			EF-001	MFT-1000				503C-D1	
C46	1500			BPD-0015	DD-152	K071	ED-0015	DC5215	5HK-D15	
C47	1000			EF-001	MFT-1000				503C-D1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C48	1000			EF-001	MFT-1000				503C-D1	
C49	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C50	1000			EF-001	MFT-1000				503C-D1	
C51	22			NP0-SI 22	TCZ-22	Z024	TCO-22		5TCC-Q22	
C52	1500			BPD-0015	DD-152	K071	ED-0015	DC5215	5HK-D15	
C53	1500			BPD-0015	DD-152	K071	ED-0015	DC5215	5HK-D15	
C54	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C55	100			NP0-SI 100	TCZ-100	TZ30	TCO-100	ZT-531	5TCC-T1	
C56	470									
C57	1000			EF-001	MFT-1000				503C-D1	
C58	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C59	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C60	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C61	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C62	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C63	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C64	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C65	10			BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C66	.02	600		BPD-02	DF-203	CUB6S2	ED-02	GEM-612	6TM-S2	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	25K	½				B13-120 · TM2-KIT		Volume
B	Shaft							
R2A	1000Ω	½				B11-108	TA13L	Meter Adjustment
B	Shaft					TM2-KIT	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	KNIGHT PART No.	IRC PART No.	NOTES
R3	2200Ω			BTS-2200	
R4	180Ω			BTS-180	
R5	2200Ω			BTS-2200	
R6	1000Ω			BTS-1000	
R7	10Ω			BTS-10	
R8	33K			BTS-33K	
R9	4700Ω			BTS-4700	
R10	220Ω			BTS-220	
R11	10K	1		BTA-10K	
R12	330Ω			BTS-330	
R13	47K	2		BTB-47K	
R14	100K			BTS-100K	
R15	100K			BTS-100K	
R16	3900Ω	2		BTB-3900	
R17	100K			BTS-100K	
R18	22K			BTS-22K	
R19	10K	1		BTA-10K	Note 1
R20	470K			BTS-470K	
R21	1Meg			BTS-1Meg	
R22	68K			BTS-68K	Note 2
R23	4700Ω			BTS-4700	
R24	180Ω			BTS-180	
R25	47K			BTS-47K	
R26	470K			BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	KNIGHT PART No.	IRC PART No.	NOTES
R27	220K			BTS-220K	
R28	4700Ω			BTS-4700	
R29	180Ω			BTS-180	
R30	100K			BTS-100K	
R31	1Meg			BTS-1Meg	
R32	15K			BTS-15K	
R33	47K	2		BTB-47K	Note 3
R34	3.3Meg			BTS-3.3Meg	
R35	100K			BTS-100K	
R36	22K	2		BTB-22K	
R37	22K	2		BTB-22K	Note 4
R38	15K			BTS-15K	
R39	100K 5%			BTS-100K 5%	
R40	100K 5%			BTS-100K 5%	
R41	150K			BTS-150K	
R42	3.3Meg			BTS-3.3Meg	
R43	1Meg			BTS-1Meg	
R44	22K	2		BTB-22K	
R45	470Ω			BTS-470	
R46	470K			BTS-470K	
R47	2.2Meg			BTS-2.2Meg	
R48	470Ω			BTS-470	
R49	1000Ω	2		BTB-1000	
R50	500Ω	10		PW10-500	
R51	22Ω			BTS-22	

Note 1. 6800Ω, 2 W used in some versions.
Note 2. Not used in some versions.
Note 3. 22K, 2 W used in some versions.
Note 4. 8200Ω, 1 W used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .5A	390VCT @ .059A	6.3VAC @ 4.3A		LP-0244					

COILS (RF-IF)

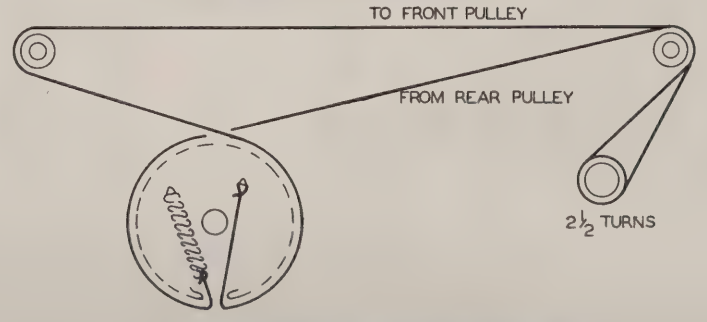
ITEM No.	USE	KNIGHT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.	LW-0096				
L2	Fil. Choke		19-1007			.68 Microhenry, IRC part #CLA
L3	RF Choke					3.3 Microhenries, IRC part #CLA
L4	FM RF Coil	LW-0097				
L5	FM Osc. Coil	LW-0050				
L6	Fil. Choke		19-1007			.68 Microhenry
L7	Loop Stick	LW-0098				214 Microhenries
L8	AM RF Coil	LW-0074				212 Microhenries
L9	AM Osc. Coil	LL-0049			70-OSC	120 Microhenries
L10	1st. FM IF	LR-0032	16-3487	FM-254	1463	Note 1
L11	1st. AM IF	LR-0041	16-6770	BC-355	12-C1	
L12	Fil. Choke		19-1007			.68 Microhenry, IRC part #CLA
L13	2nd. FM IF	LR-0043	16-3487	FM-254	1463	
L14	2nd. AM IF	LR-0041	16-6770	BC-355	12-C2	
L15	3rd. FM IF	LR-0043	16-3487	FM-254	1463	
L16	FM Limiter	LR-0043	16-3487	FM-254	1463	
L17	Discriminator	LQ-0179	17-3494	FM-253	1464	
L18	RF Choke		19-1007			.68 Microhenry IRC part #CLA

Note 1. Alternate Part #LR-0042.

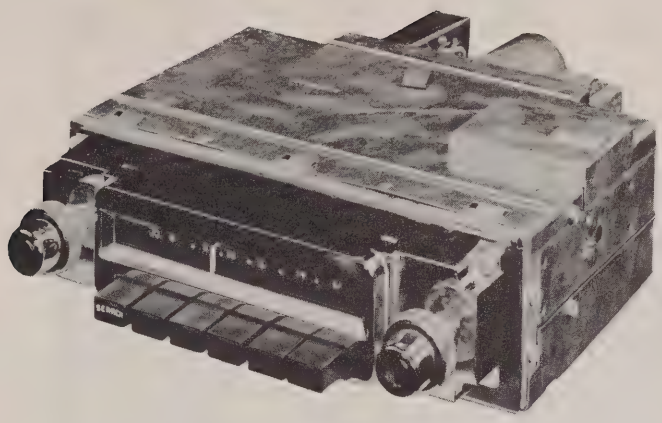
MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Pilot Lamp		#47 (AM)
M2	Pilot Lamp		#47 (FM)
M3	Dial Lamp		#44
M4	Dial Lamp		#44
M5	Tuning Cap.	CV-102C	6 Gang (AM sections: 17-420MMF, 21-422MMF, 13-190MMF)
M6	Switch		On-off-selector (Rotary-wafer type)
M7	Meter		Tuning

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MOPAR
MODELS 916, 916HR

TRADE NAME	Mopar Models 916, 916HR (For P28, P29 Plymouth Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Nine)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AF Amp., 12AV6 Phase Inv. -AVC., (2) 12AB5 Output, 12AU7 Trigger, 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set volume control to minimum.
Set tone control to "Treble".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400~ Mod)	High frequency end stop.	DC probe to point (A). Common to chassis.	A2, A3, A4	Adjust for maximum deflection.
2.	"	"	"	"	"	A1	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy to antenna receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	Adjust for maximum deflection.
	The following steps are unnecessary unless tuner has been tampered with or incase of component replacement. If necessary, back tuner cores out of coil forms (approx. 1 3/4"). Repeat step 3.						
4.	Fig. 1	Thru dummy to antenna receptacle. Low side to chassis.	1020KC	Back tuner core carriage 49/64" from high freq. end stop.	DC probe to point (A). Common to chassis.	A8, A9, A10	Adjust for maximum deflection using alignment tool in Fig. 2.
5.	"	"	1610KC	High frequency end stop.	"	A5, A6, A7	Adjust for maximum deflection.
	With receiver installed in car and antenna fully extended, tune in a weak station near 1400KC. Adjust A7 for maximum deflection.						

POINTER CALIBRATION

Tune receiver to 1000KC signal and adjust pointer adjust cam so pointer coincides with 1000KC on dial scale.

PUSHBUTTON ADJUSTMENT

1. Turn on receiver and allow fifteen minute warm-up period. Antenna fully extended.
2. Unlock pushbuttons by pulling them to the left and out.
3. Accurately tune in a station with manual tuning knob.
4. Lock one pushbutton to that station by pressing in firmly.
5. Repeat above procedure on remaining pushbuttons.

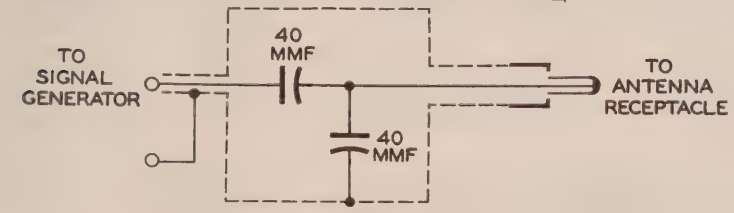


FIG. 1

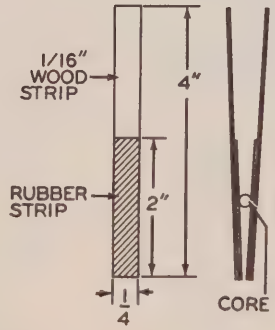


FIG. 2

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det-AF Amp.	12AV6	
V5	Phase Inv. -AVC	12AV6	
V6	Output	12AB5	
V7	Output	12AB5	
V8	Trigger	12AU7	
V9	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	23A532094	AFH3-107	CO800	FP329.5	TMT-92	T-470	TVL-3635
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

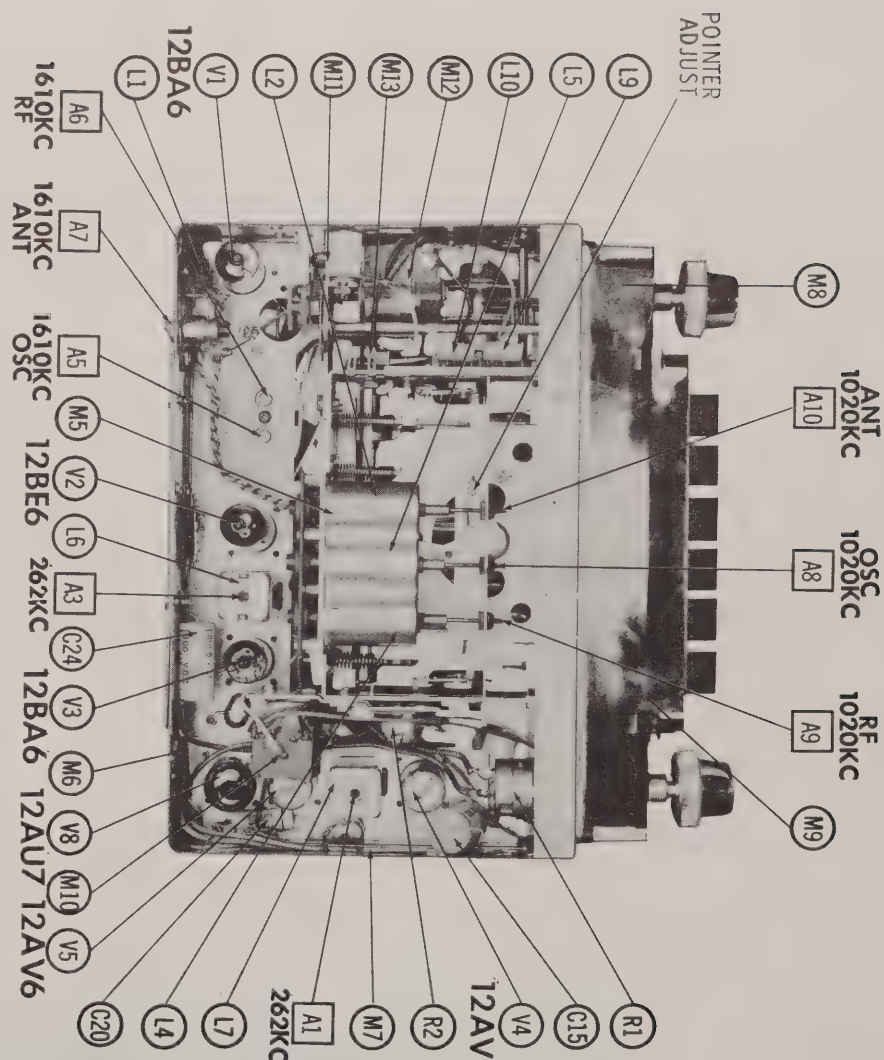
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	27		21R119295	N750-SI 25	TCN-27	TN08	TC7-27		5TCU-Q25	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C4	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C5	.1	400	8R121006	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C6	.1	200	8R121573	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C7	56		21R120152							
C8	100		21R115042							
C9	100		21R400537	N750-DI 100	TCN-100	N042	TC7-100	NT-531	5TCU-T1	
C10	100		21R400537	N750-DI 100	TCN-100	N042	TC7-100	NT-531	5TCU-T1	
C11	5000		21R115312	BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C12	470		21R114554	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47	
C13	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C14	.1	200	8R121573	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C15	.25	100	8K122045	P288N-25		CUB2P25		GEM-2025	2TM-P25	
C16	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C17	5000		21R115312	BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C18	470		21R114554	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47	
C19	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C20	.002	600	8R121568	BPD-002	D6-202	CUB6D22	GP-2000	GEM-622	6TM-D2	
C21	.04	1000	8A121549	P1088N-04		CUB16S4		GEM-1014	MB-S4	
C22	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C23	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C24	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4Meg*	1/2	18B536704		RTV-610C			Tone Volume
B	3Meg	1/2						
C	Switch							
R2	20Ω	1	18A537014		39-50			Motor Speed

* Open in center.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R3	2.2Meg		6R3927	BTS-2.2Meg	
R4	10K	1	6R5570	BTA-10K	
R5	68Ω		6R2039	BTS-68	
R6	330K		6R6014	BTS-330K	
R7	47K		6R6056	BTS-47K	
R8	1.5Meg		6R6460	BTS-1.5Meg	
R9	12K	4	17K737688	1 3/4A-10-12K	
R10	270Ω		6R6432	BTS-270	
R11	1Meg		6R6046	BTS-1Meg	
R12	1.5Meg		6R6460	BTS-1.5Meg	
R13	180Ω		6R5660	BTS-180	
R14	100K		6R6075	BTS-100K	
R15	3.3Meg		6R6497	BTS-3.3Meg	
R16	6.8Meg		6R3987	BTS-6.8Meg	
R17	220K		6R6015	BTS-220K	
R18	6.8Meg		6R3987	BTS-6.8Meg	
R19	56K	2	6R6402	BTB-56K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R20	220K		6R6015	BTS-220K	
R21	1500Ω		6R6038	BTS-1500	
R22	470K		6R6377	BTS-470K	
R23	560K		6R5697	BTS-560K	
R24	470K		6R6377	BTS-470K	
R25	2200Ω		6R6069	BTS-2200	
R26	330Ω	1	6R6254	BTA-330	
R27	390Ω		6R5554	BTS-390	
R28	2200Ω		6R6069	BTS-2200	
R29	560Ω		6R6291	BTS-560	
R30	5.6Meg		6R3988	BTS-5.6Meg	
R31	4700Ω	1	6R5576	BTA-4700	
R32	47K	1	6R6462	BTA-47K	
R33	120K		6R5631	BTS-120K	
R34	5600Ω	1	6R5654	BTA-5600	
R35	47K	1	6R6462	BTA-47K	
R36	2200Ω	1	6A533220	BTA-2200	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 2.1A	540VCT @ .069A			25C535794			P-6493	22R52 ①	

① Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6400Ω	3-4Ω	25B533038	Z1004 ①	A-2900 ①	A-3856 ①	22S47 ①	S-51X ①	① Fabricate mounting.

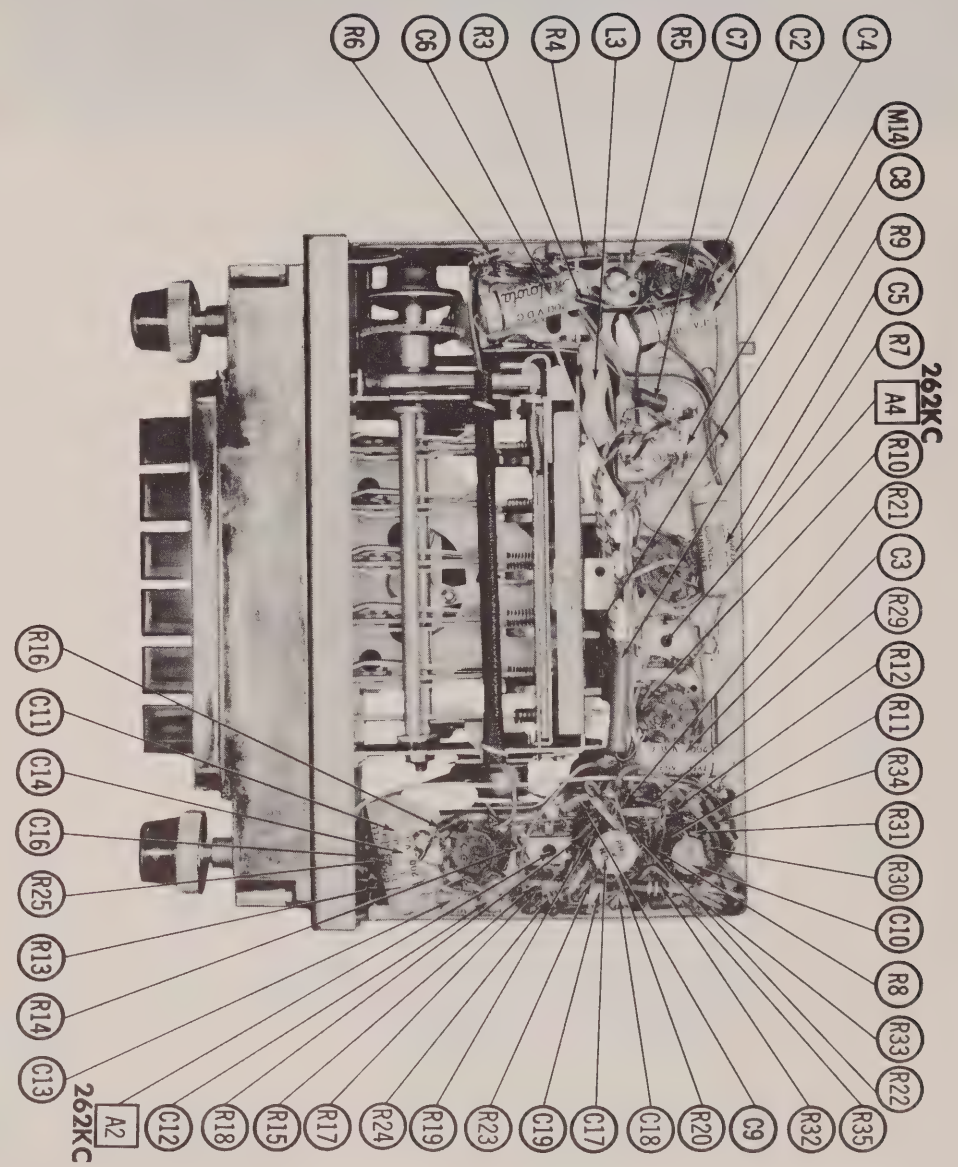
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	7"	PM	3-4Ω	50C533635	7A31	① Alternate
	7"	PM	3-4Ω	50B533217 ①	7A31	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	24A532148	19-6033			31 Microhenries
L2	Ant. Coil	1B534760				
L3	IF Trap	24B532979	19-4201		6154	207 Microhenries
L4	RF Coil	1B534760				
L5	Osc. Coil	1B535476				
L6	Input IF	24B580193	16-6752	BC-350	12-H1	
L7	Output IF	24B533073				
L8	Vib. Hash Choke	24A534494				21.2 Microhenries
L9	Search Motor Hash Choke	24A535789				3 Microhenries
L10	Search Motor Hash Choke	24A535789				3 Microhenries

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	48B522000	6301	G859	6301	

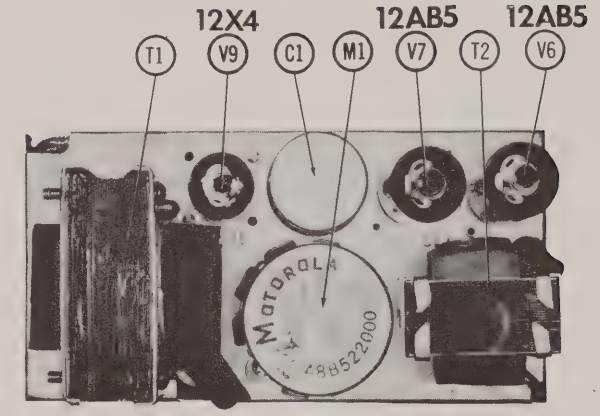
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A	65R16248	9K535718	307009. (SFE-9A)	155009	SFE 9	HRH

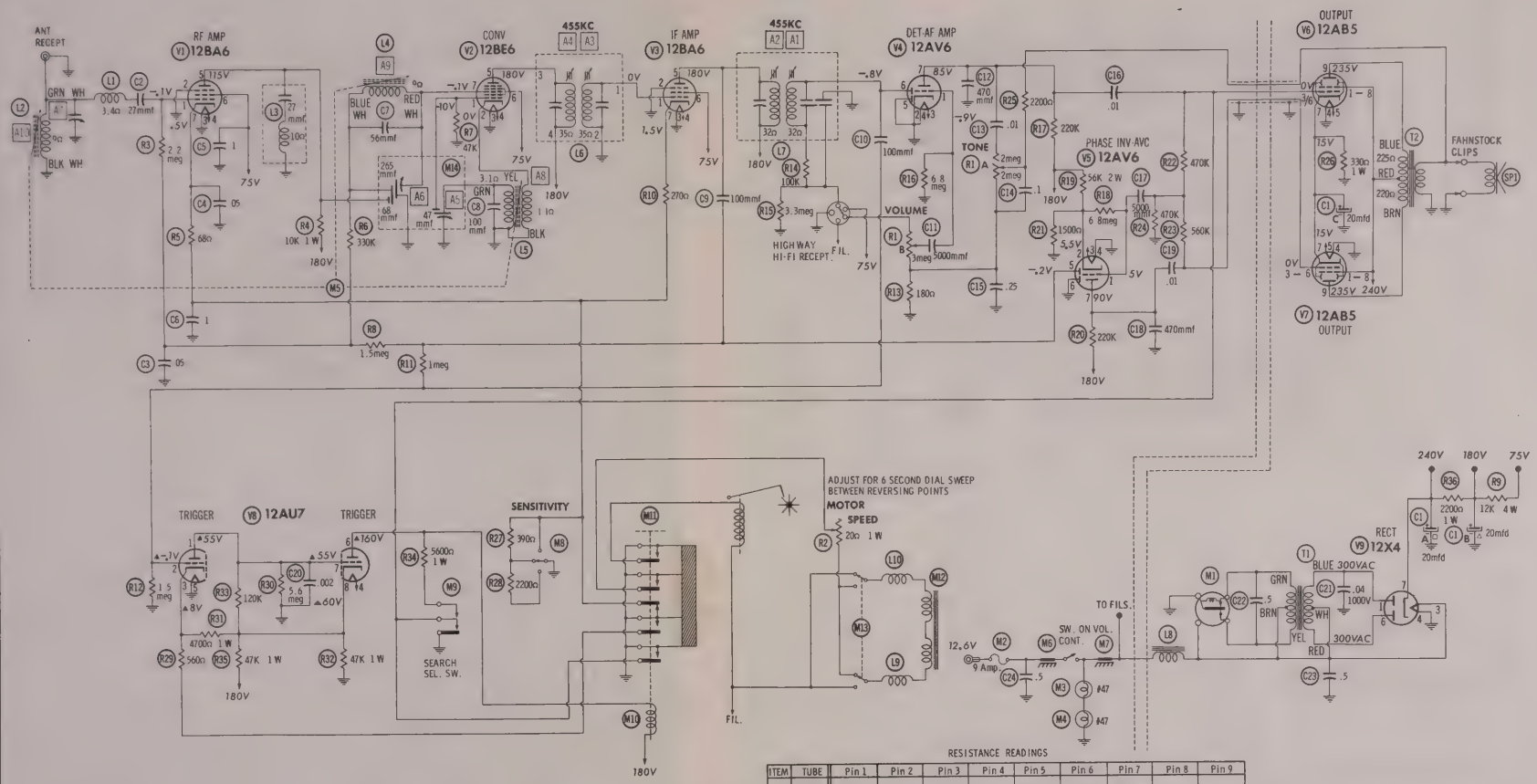
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Lamp	65X11854	6V, #47
M4	Dial Lamp	65X11854	6V, #47
M5	Tuner	77E537455	Complete (ST-176)
M6	Spark Plate	64K530177	
M7	Spark Plate	64K530177	
M8	Switch	40B535781	Sensitivity (Rotary, 3 Position, Single Pole)
M9	Switch	40A536675	Search Selector
M10	Relay	80B535520	
M11	Solenoid	59A537563	
M12	Motor	59C535466	
M13	Switch	40B535396	Motor Reversing
M14	Trimmer Ass'y.	20K533409	Includes A5 Osc. (120-220MMF, A6 RF (19-170MMF), 68MMF, 265MMF, 47MMF.
A7	Trimmer	20B532899	Ant. (20-150MMF)
	Dial Crystal	61K532894	
	Pushbutton Ass'y.	38B533284	
	Pushbutton Ass'y.	38B536705	Search
	Clutch & Disc. Ass'y.	64B534026	
	Knob	1V533308	On-Off-Vol. & Tuning
	Knob	36B533005	Tone & Sensitivity

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	6Meg	0Ω	0Ω	1.5Ω	†12K	†15K	68Ω		
V2	12BE6	47K	1.1Ω	0Ω	1.5Ω	†2200Ω	†15K	4.3Meg		
V3	12BA6	35Ω	0Ω	0Ω	1.5Ω	†2200Ω	†15K	270Ω		
V4	12AV6	6.8Meg	0Ω	1.5Ω	0Ω	0Ω	1.6Meg	†222K		
V5	12AV6	6.8Meg	1500Ω	1.5Ω	0Ω	2.5Meg	0Ω	†222K		
V6	12AB5	†0Ω	NC	900K ą	0Ω	1.5Ω	500Keą	330Ω	†0Ω	†225Ω
V7	12AB5	†0Ω	NC	1 Meg	0Ω	1.5Ω	1 Meg ą	330Ω	†0Ω	†220Ω
V8	12AU7	†170K	1.5Meg	37K	1.5Ω	0Ω	†4400Ω	† 170K	32K	NC
V9	12X4	260Ω	NC	1.5Ω	0Ω	NC	260Ω	30K		

† MEASURED FROM PIN 7 OF V9.
ą MEASURED WITH SEARCH SELECTOR SWITCH (M9) CLOSED.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12. 6volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA MODELS
57RF1, 57RF2 (Ch. HS-542)

MOTOROLA MODELS
57RF1, 57RF2 (Ch. HS-542)

TRADE NAME	Motorola Models 57RF1, 57RF2 (Ch. HS-542)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated AM Receiver With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001 MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

MOTOROLA RECORD CHANGER MODEL BR2RC

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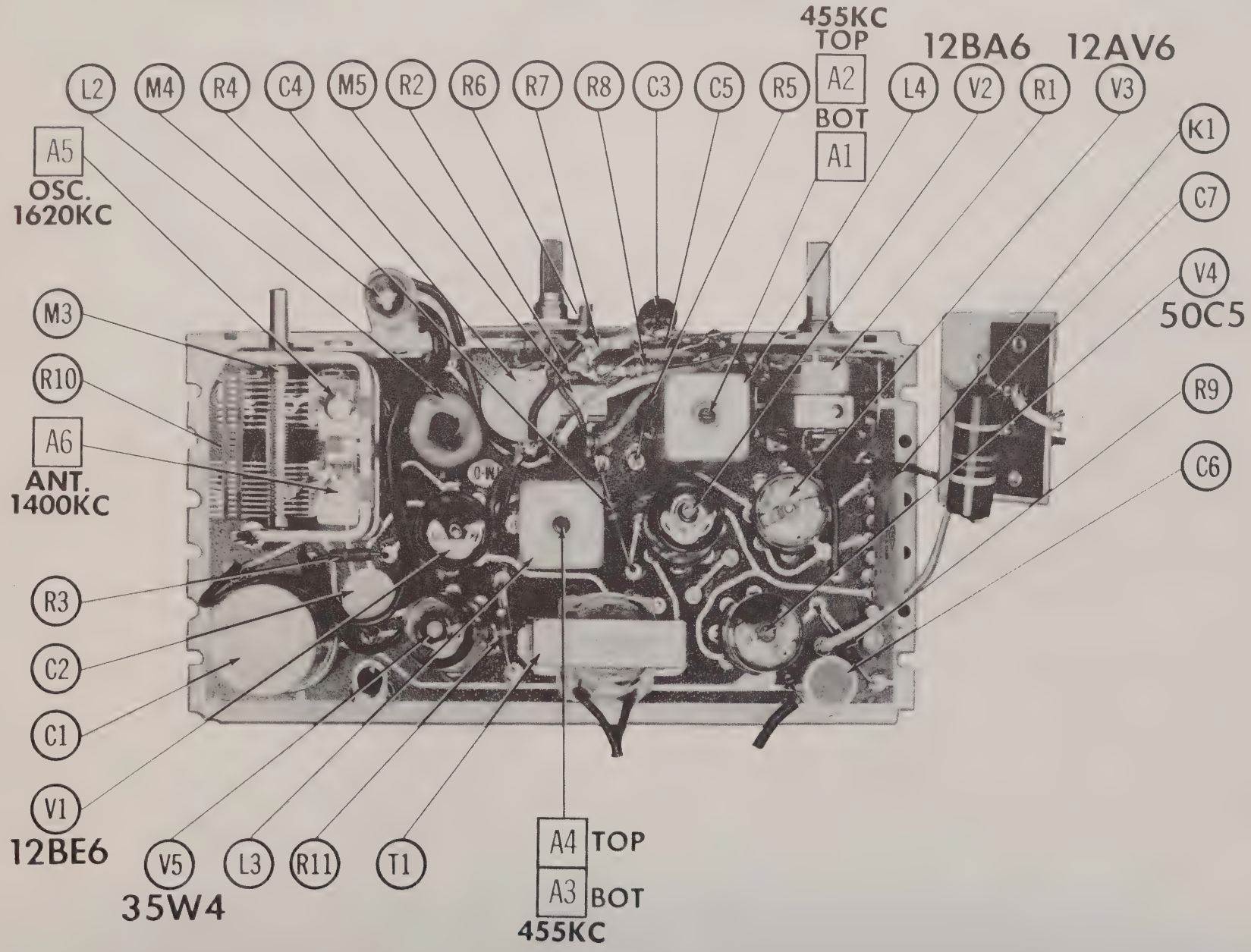


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amplifier	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 50	150	23B632015	AFH2-15	B0150	FP213	TMD-12	D-065	TVL-2432
B	▲ 30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200	8B120842	BPD-05	DF-503			ACE615	2SE-S47	
C3	.047	200		BPD-05	DF-503			ACE6147	2SE-S47	
C4	4700		21R120149	BPD-0047	DD-472	K079	GP-4700	UC-5247	5HK-D47	
C5	2000		21R121106	BPD-002	DD-202	K072	GP-2000	DC-522	5HK-D2	
C6	.01	400	8K122334	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C7	.047	400	8K490232	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2Meg	½	18B636627					Volume (Tap @ 600K) & Switch
R2	1Meg	½	18B634577					Tone & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	22K		6R6028	BTS-22K	
R4	3.3Meg		6R2118	BTS-3.3Meg	
R5	100Ω		6R6018	BTS-100	
R6	3.3Meg		6R2118	BTS-3.3Meg	
R7	39K		6R6487	BTS-39K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R8	39K		6R6487	BTS-39K	
R9	150Ω		6R3992	BTS-150Ω	
R10	1000Ω	1	6B119404	BTA-1000	
R11	27Ω		6R5683	BTS-27	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	3-4Ω	25B633669-A	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Use original mtg. frame.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	50C636119	52A1	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L1	Loop Stick	24B636625				
L2	Osc. Coil	24B631990			13-PC2	
L3	Input IF	24K632782				
L4	Output IF	24K632039	16-6780			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Det. -Audio Net	5000MMF, 5000MMF, 250MMF, 220MMF, 6.8Meg, 470K, 470K	51B635833	Aerovox PA512 Centralab PCT-158 Sprague DT-5

PHONO CARTRIDGE

ITEM No.	MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1		55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

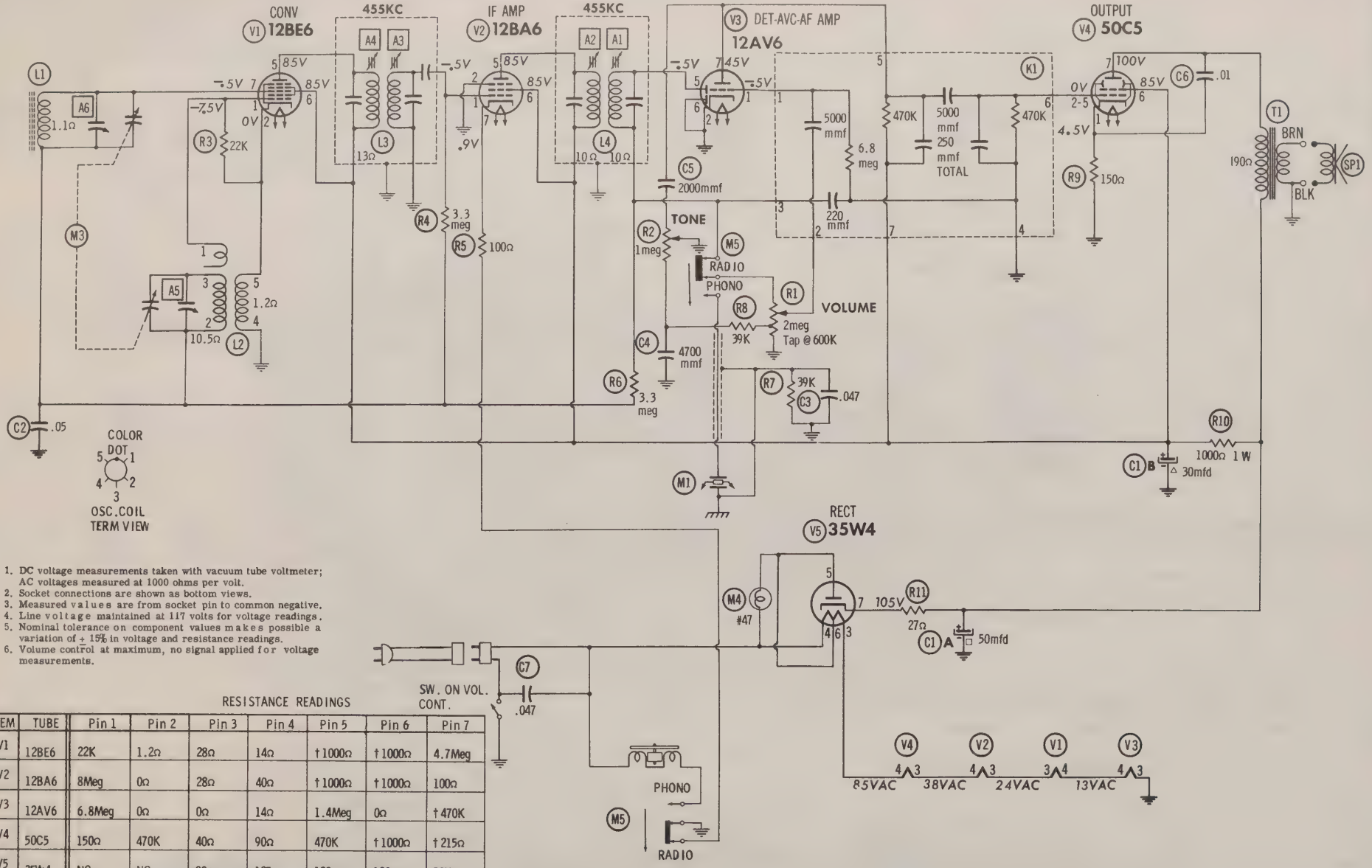
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	MOTOROLA PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		† S-66 or ♦† S-66SD or ♦ S-66D	† W-75TPS or ♦† W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuning Cap	19K636277	2 Gang
M4	Lamp	65X11854	#47
M5	Switch	18B634577	Radio-Phono (Includes R2)
	Cabinet	16K636291	Model 57RF2
	Cabinet	16E636290	Model 57RF1
	Knob	36K633568	Tuning
	Knob	36B636210	Vol. And Tone
	Handle	55K636310	Model 57RF2
	Handle	55K636294	Model 57RF1



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.2Ω	28Ω	14Ω	†1000Ω	†1000Ω	4.7Meg
V2	12BA6	8Meg	0Ω	28Ω	40Ω	†1000Ω	†1000Ω	100Ω
V3	12AV6	6.8Meg	0Ω	0Ω	14Ω	1.4Meg	0Ω	†470K
V4	50C5	150Ω	470K	40Ω	90Ω	470K	†1000Ω	†215Ω
V5	35W4	NC	NC	90Ω	125Ω	120Ω	120Ω	50K

ALL MEASUREMENTS TAKEN IN RADIO POSITION.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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MOTOROLA MODELS
67X1, 67X2 (Ch. HS-526)

MOTOROLA MODELS
67X1, 67X2 (Ch. HS-526)

TRADE NAME	Motorola Models 67X1, 67X2 (Ch. HS-526)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12CR6 Det-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .3 Amp. @ 117 Volts AC (27 Watts)
TUNING RANGE—BROADCAST	530KC - 1620KC

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6, A7	Fashion loop of several turns or wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 67X1 (Ch. HS-526)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	

ITEM No.	USE	TYPE	NOTES
V4	Det-AVC-AF Amp.	12CR6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	23B634167	PRS150V4030	BBRT43215	TCT3285	TDLT-3	FMT-312	TVA-3448
B	30	150		20					
C	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		21R400537	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S5			2TM-S5	
C4	100		21R400537	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C5	100		21R400537	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C6	.006	400	8R121001	BPD-006	D6-602	CUB6D6		GEM-626	6TM-D6	
C7	.006	400	8R121001	BPD-006	D6-602	CUB6D6		GEM-626	6TM-D6	
C8	330		21R410118	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C9	.05	400	8R121567	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C10	.001	600	8R122103	BPD-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C11	.01	200	8R121868	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	2TM-S1	
C12	10000		21R121946	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C13	.047	400	8K490232	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C14	.1	600	8R121869	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg		18K635631	F1-54			UF16A	Tone
B	500K			R2-46			UR55-T254	Volume, Tap ② 250K
C	Switch			KB-1			US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

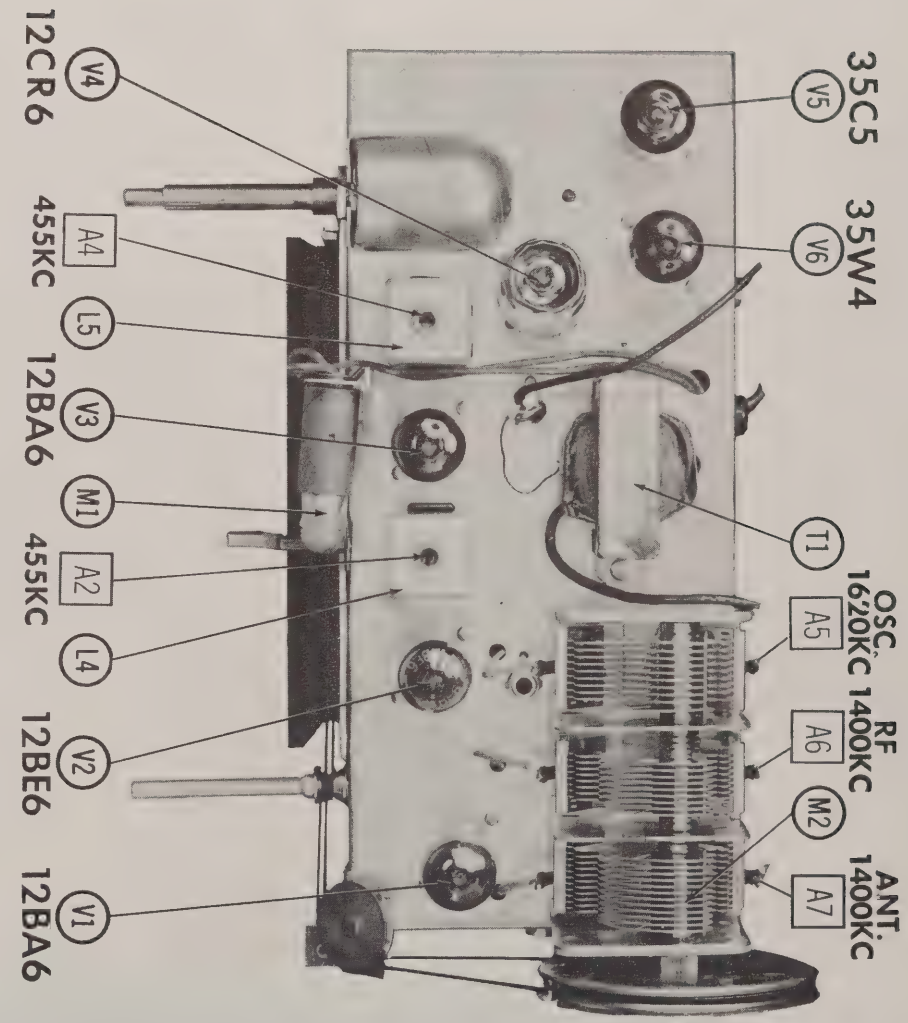
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470K		6R6032	BTS-470K	
R3	150Ω		6R6373	BTS-150	
R4	22K		6R6028	BTS-22K	
R5	470K		6R6032	BTS-470K	
R6	82Ω		6R2035	BTS-82	
R7	2.2Meg		6R3927	BTS-2.2Meg	
R8	100K		6R6075	BTS-100K	
R9	39K		6R6487	BTS-39K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	33K		6R6012	BTS-33K	
R11	2.2Meg		6R3927	BTS-2.2Meg	
R12	100K		6R6075	BTS-100K	
R13	470K		6R6032	BTS-470K	
R14	470K		6R6032	BTS-470K	
R15	150Ω		6R6373	BTS-150	
R16	390Ω	1	6R5598	BTA-390	
R17	390Ω	1	6R5598	BTA-390	
R18	15Ω		6R2034	BTS-15	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3750Ω	6-8Ω	25C634160	Z1000 ①	A-2902 ②	A-2203 ②	22S86	S-5LX ①	① Tape center tap on primary. ② Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

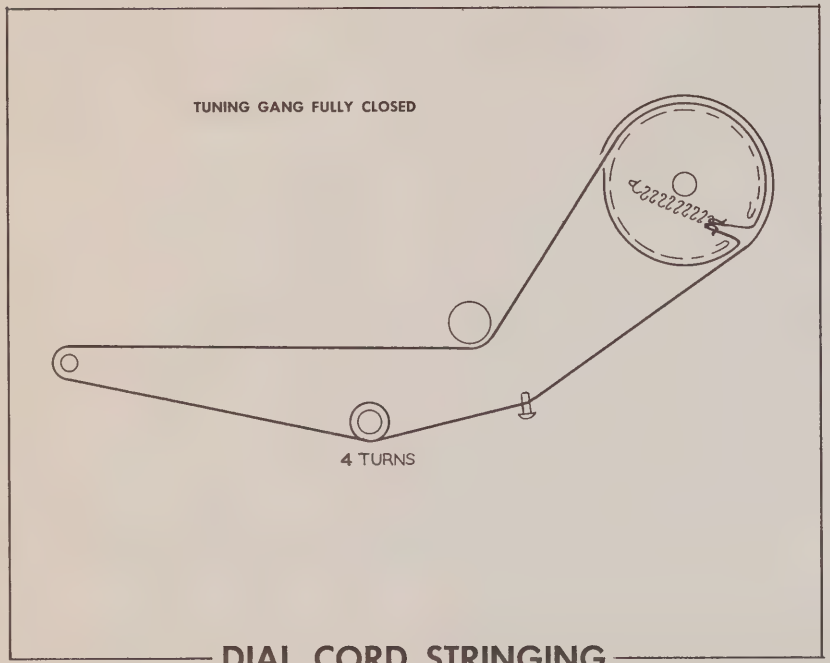
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	50C634191 ①	4A07 ①②	① Connect in series & phase.
SP2	4"	PM	3-4Ω	50C634191 ①	4A07 ① ②	② Trim corners to match original.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	1V635882				Includes cabinet back.
L2	RF Coil	24B634119	14-1076			
L3	Osc. Coil	24B634118			69-Osc.	
L4	Input IF	24C632774	16-6758	BC-352	12-C1	
L5	Output IF	24K632775	16-6770	BC-355	12-C6	

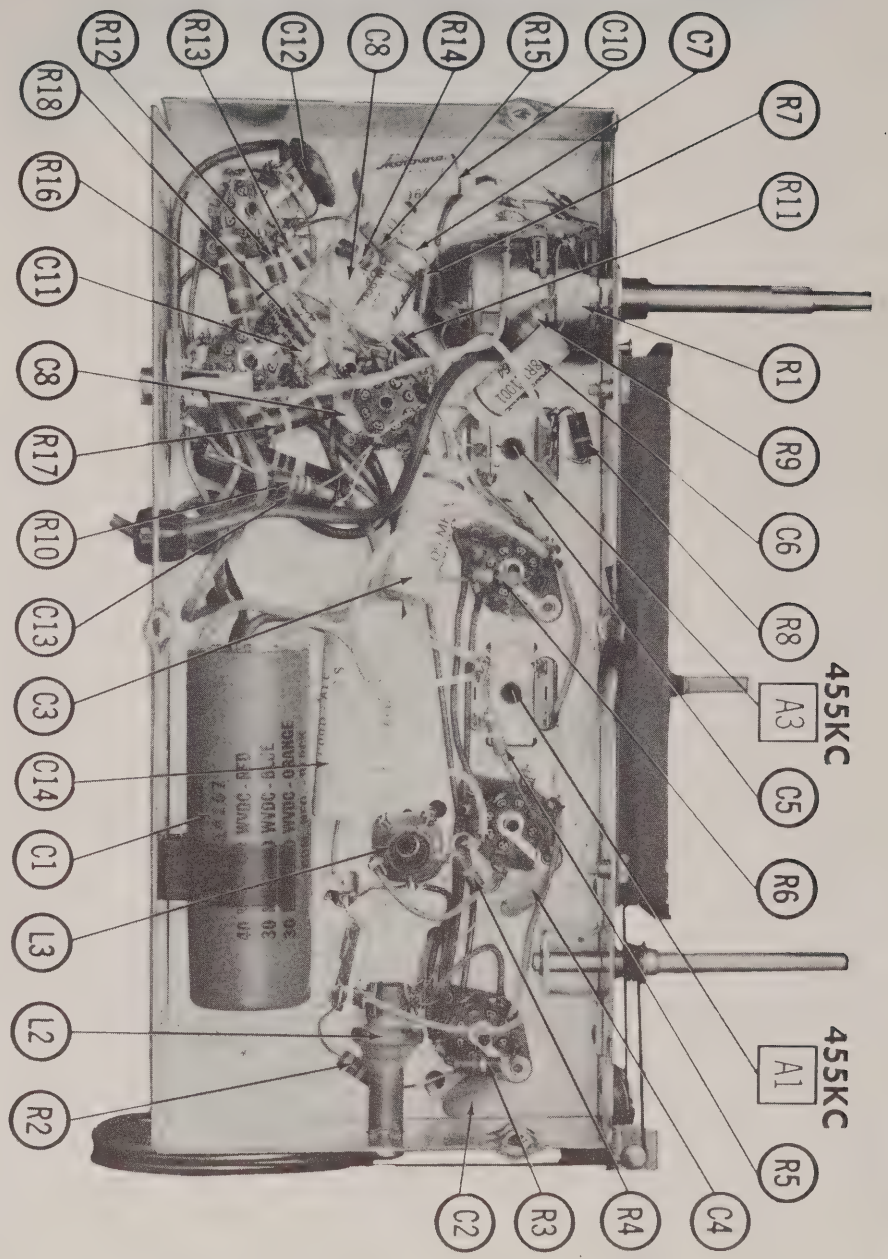
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Dial Light	65X11854	#47
M2	Tuning Cap.	19B634159	3 Gang (19-385MMF, 19-285MMF, 25-150MMF)
	Pointer	52K634509	Dial
	Knob	36K634197	Tone
	Knobs	36K634194	On-Off-Volume, Tuning
	Cabinet	1V634368	Ivory, Model 67X2.
	Cabinet	1V634338	Mahogany, Model 67X1.
	Dial Scale	1V636377	Includes Mask.

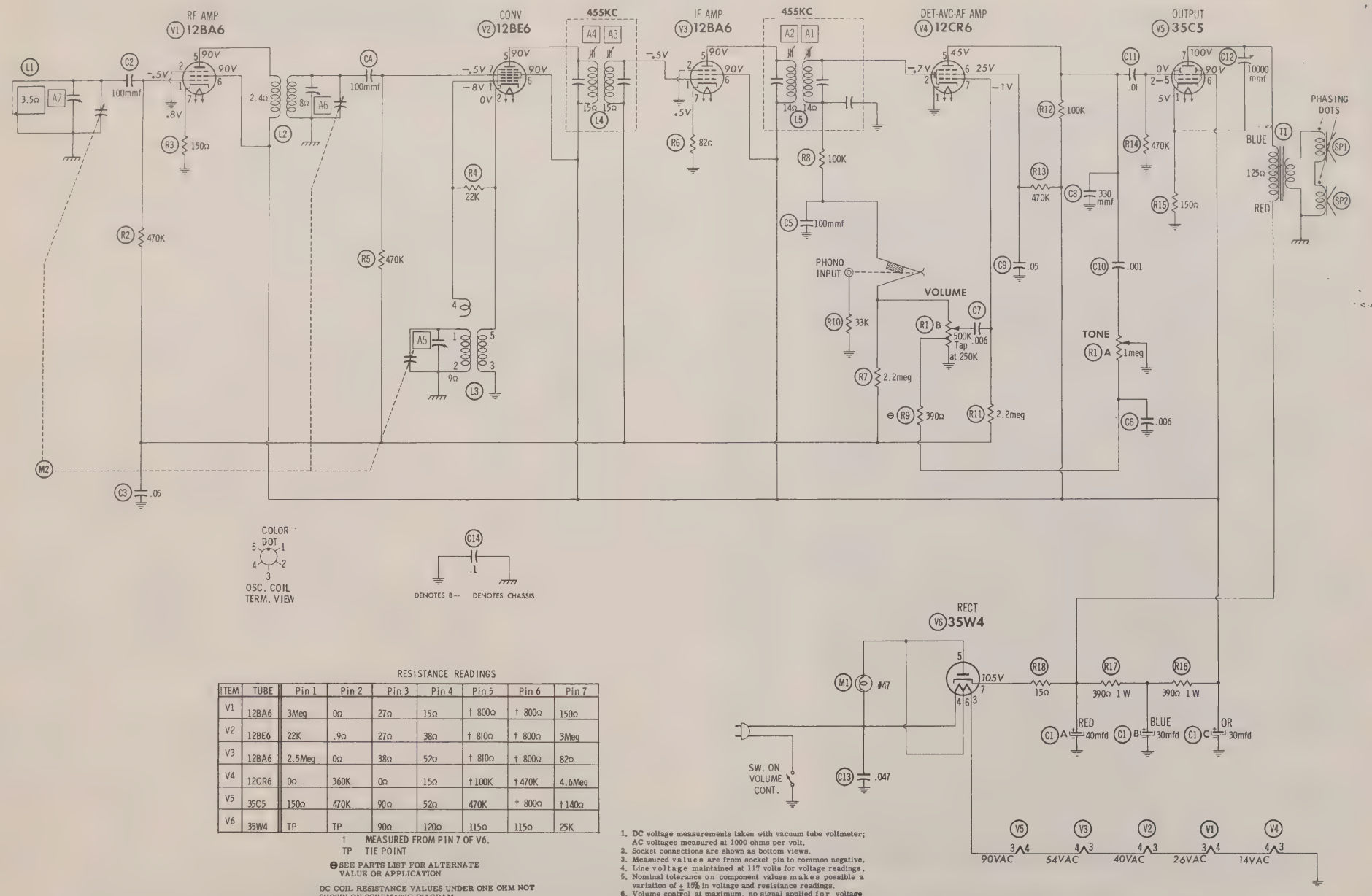


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



MOTOROLA
MODEL 67X1 (Ch. HS-526)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3Meg	0Ω	27Ω	15Ω	† 800Ω	† 800Ω	150Ω
V2	12BE6	22K	.9Ω	27Ω	38Ω	† 810Ω	† 800Ω	3Meg
V3	12BA6	2.5Meg	0Ω	38Ω	52Ω	† 810Ω	† 800Ω	82Ω
V4	12CR6	0Ω	360K	0Ω	15Ω	†100K	†470K	4.6Meg
V5	35C5	150Ω	470K	90Ω	52Ω	470K	† 800Ω	†140Ω
V6	35W4	TP	TP	90Ω	120Ω	115Ω	115Ω	25K

† MEASURED FROM PIN 7 OF V6.
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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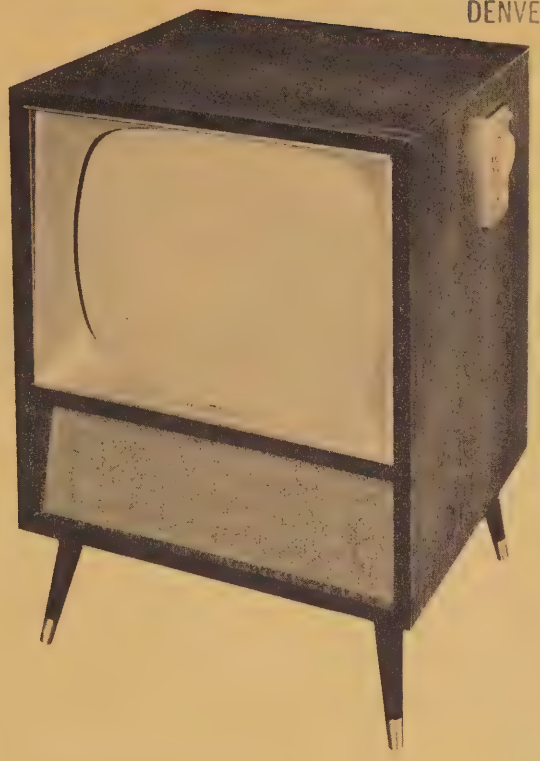

MUNTZ MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82

MUNTZ MODEL 721CW

TRADE NAME	Muntz	MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82
MANUFACTURER	Muntz TV Inc., 1000 Grey Avenue, Evanston, Illinois	
TYPE SET	Television Receiver	
TUBES	Eleven	
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 110 Watts, 1.12 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

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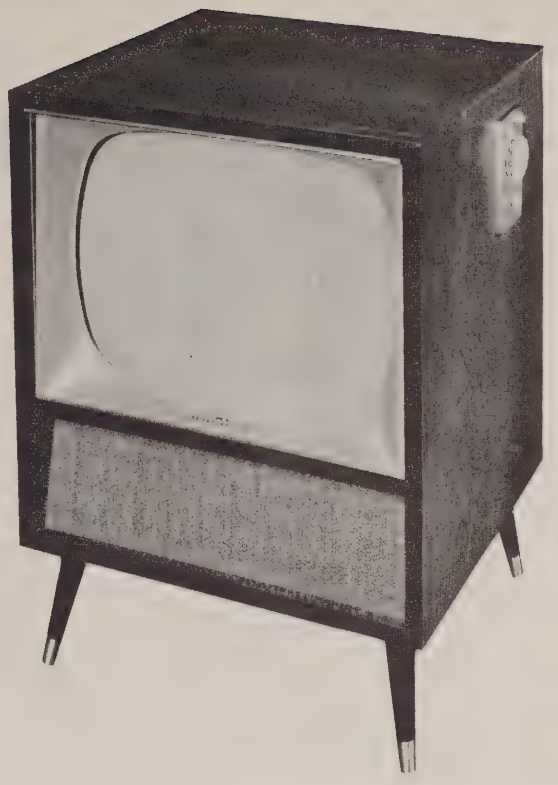
RETMA MEMBER



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 2 push-on type control knobs (channel selector and off/on volume) from side panel of cabinet. Remove 2 wood screws holding escutcheon panel and remove 4 small control knobs.

2. Remove 8 wood screws. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 4 chassis mounting board bolts. Remove chassis with mounting board.

5. Remove 4 speaker nuts. Remove speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

MODEL
721CW

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding metal molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Remove the rear cover and supply power to the set. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the discriminator secondary (A11) located on top of the chassis.

FOCUS ADJUSTMENT

Focus may be varied by means of a jumper on picture tube base. This jumper may be connected between pins y and 2 or 6 and 10. The Ion trap should again be adjusted for maximum brightness consistent with best focus.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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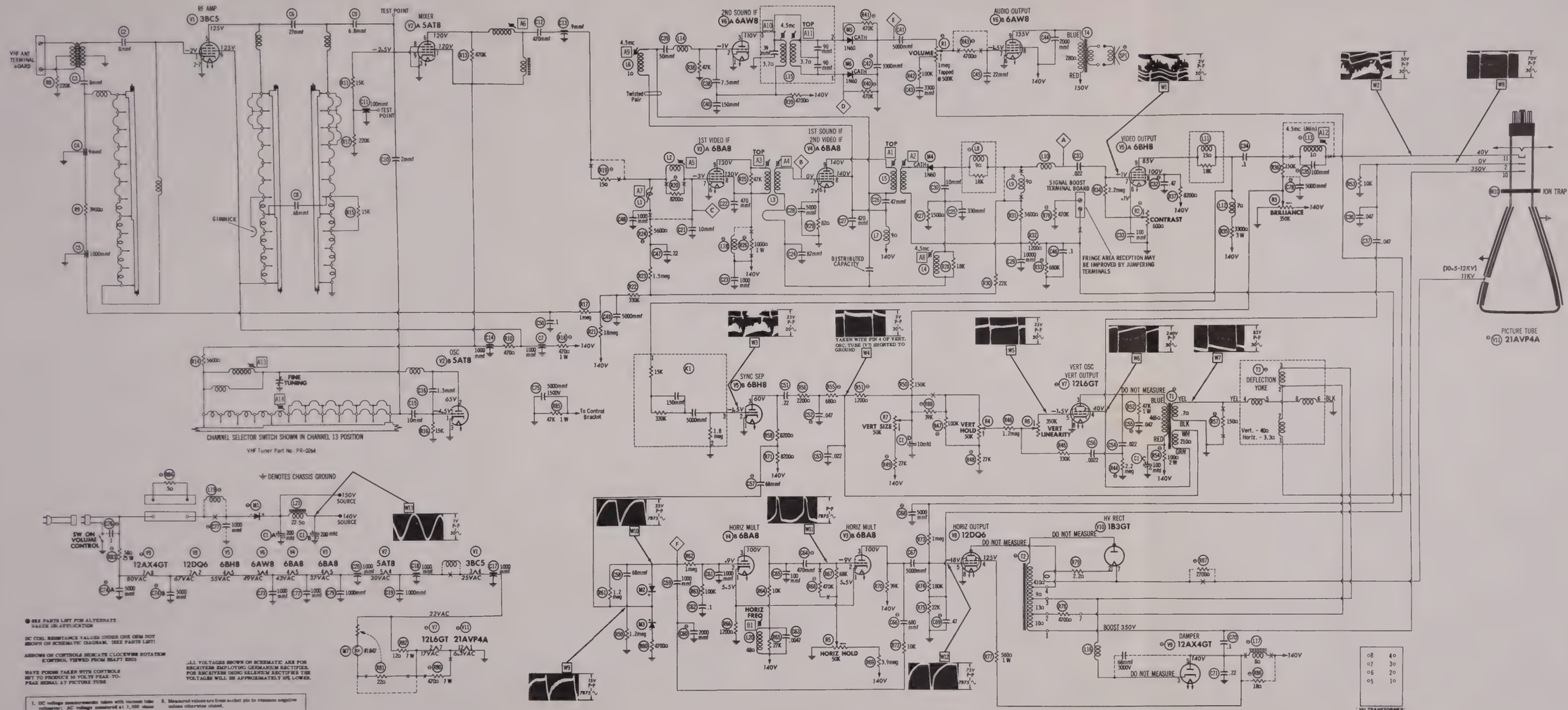
G857

DATE 3-57 SET 352 FOLDER 12



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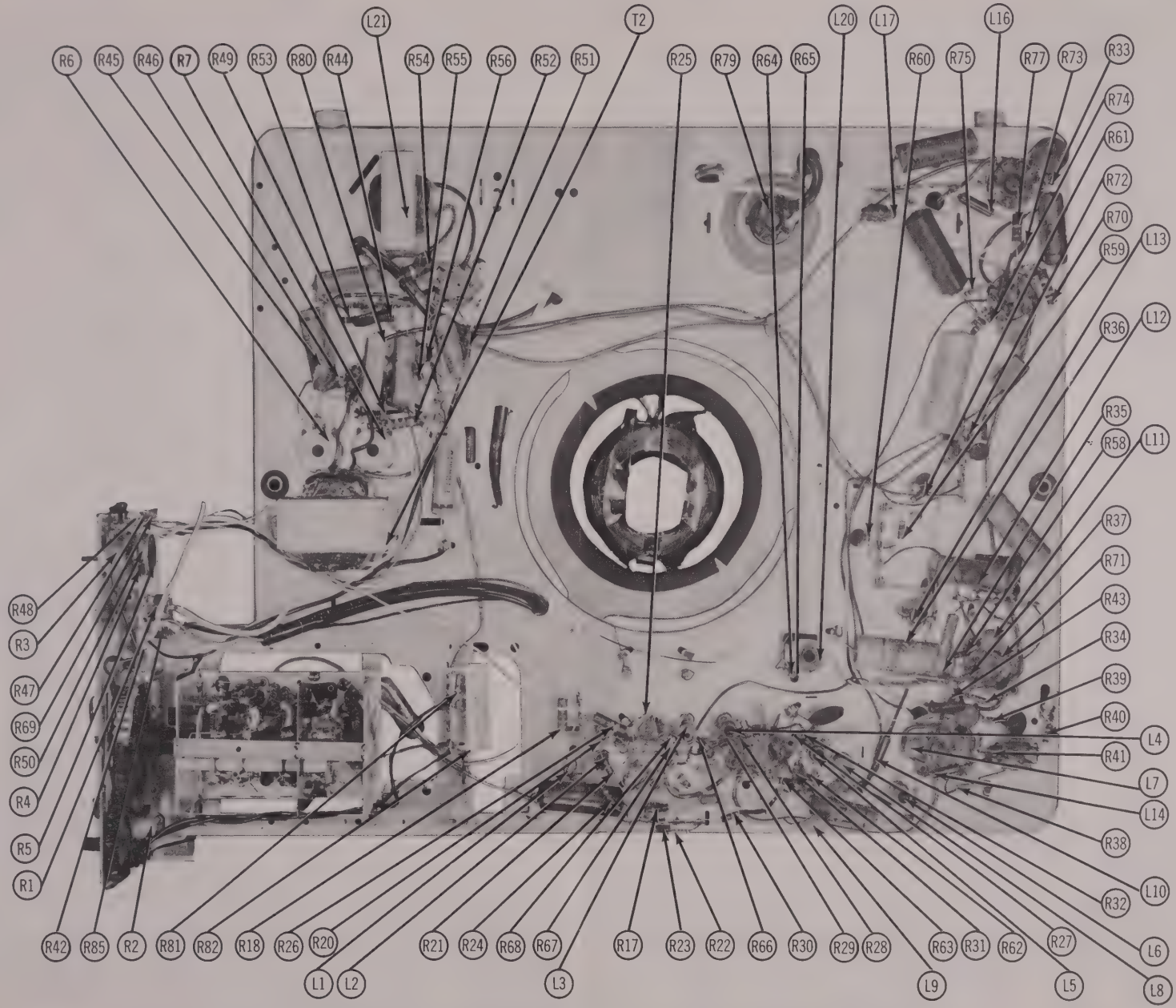

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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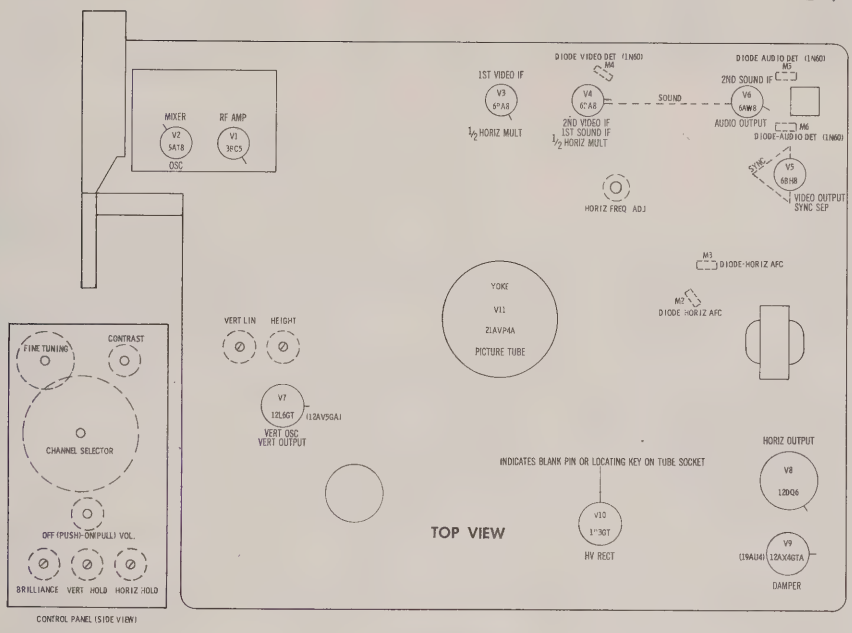


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

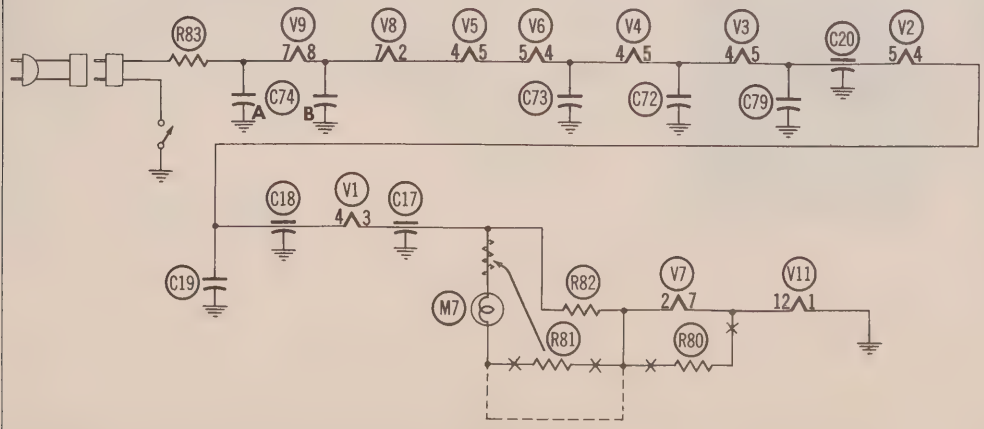
POWER SUPPLY FAILURE
No raster, no sound - Rectifier (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V5, V11
Has pic, no sound - V4, V6

SYNC FAILURE
No vert. sync - V5, V7
No horiz. sync - V3, V4, V5
No vert. or horiz. sync - V5

SWEEP FAILURE
No raster, has sound - V3, V4, V8, V9, V10
No vertical deflection - V7
Poor vert. linearity or foldover - V7
Poor horiz. linearity or foldover - V3, V4, V8, V9
Narrow picture - V3, V4, V8, V9, M1
Vert. off freq. - V5, V7
Horiz. off freq. - V3, V4, V5

Since this receiver employs tubes used in series, filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)



SET 352 FOLDER 12

MUNTZ MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5.5 volt bias supply to the ungrounded side of C47. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point Ⓑ. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.5MC 43.0MC 44.75MC 45.75MC 47.25MC	Any unused channel	Vert. amp. thru 15K to point Ⓐ. Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1 peaking at approximately 44.25MC.
2.	"	High side to point Ⓒ. Low side to chassis.	"	"	"	"	A3, A4	Adjust for response similar to Fig. 2.
3.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	"	"	"	"	A5	Adjust for response similar to Fig. 2 peaking at approximately 44.5MC.
4.	"	"	"	"	"	"	A6, A7	Adjust A6 to control steepness of low frequency side of response curve. Adjust A7 for maximum amplitude of response curve similar to Fig. 3. If necessary, retouch A5 to obtain proper response curve.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (unmod)	Any unused channel.	DC probe to point Ⓓ thru 10K. Low side to chassis.	A8, A9, A10	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point Ⓔ thru 10K. Low side to chassis.	All	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

ALTERNATE SOUND IF ALIGNMENT USING TV SIGNAL

Tune in a weak TV station and adjust for a normal picture. Adjust A8, A9 and A10 for maximum volume and minimum noise.
Tune in a strong station and adjust All for maximum volume. Repeat adjustment of A8, A9 and A10 for optimum performance and elimination of buzz and distortion.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal (black and white, not color) and adjust the fine tuning until a 4.5MC beat pattern can be seen in the picture. Adjust A12 for MINIMUM beat interference. Adjust carefully as this is a critical adjustment.

OSCILLATOR ALIGNMENT FOR TUNERS #PR-0254, PR-0264 AND PR-0268

Turn the set on and tune in the highest channel of channels 7 to 13 operating in the vicinity. Set the fine tuning control to its mid-range position. (On PR-0254 the knob slug of the center shaft should be parallel with the chassis, on PR-0264 and PR-0268 the flat portion on the large gear must be perpendicular to the chassis). Adjust the high band oscillator slug (A13) for best picture and sound. Leaving the fine tuning in its mid-range position, tune in the highest low band (2 to 6) channel operating in the vicinity and adjust(A14)for the best picture and sound.

OSCILLATOR ALIGNMENT FOR TUNERS #PR-0253, PR-0263 AND PR-0276

The individual channel oscillator adjustment screws (A15 thru A26) are reached through a hole behind the channel selector and fine tuning knobs. Set the fine tuning to the center of its range and adjust each channel (operating in the vicinity) for best picture and sound.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

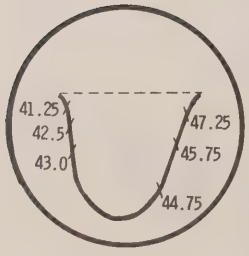


FIG. 1

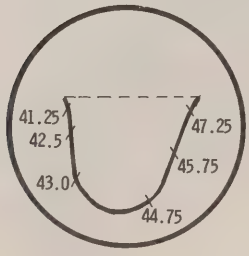


FIG. 2

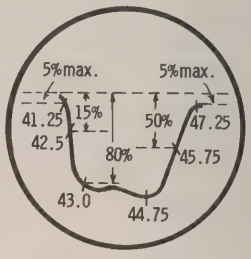


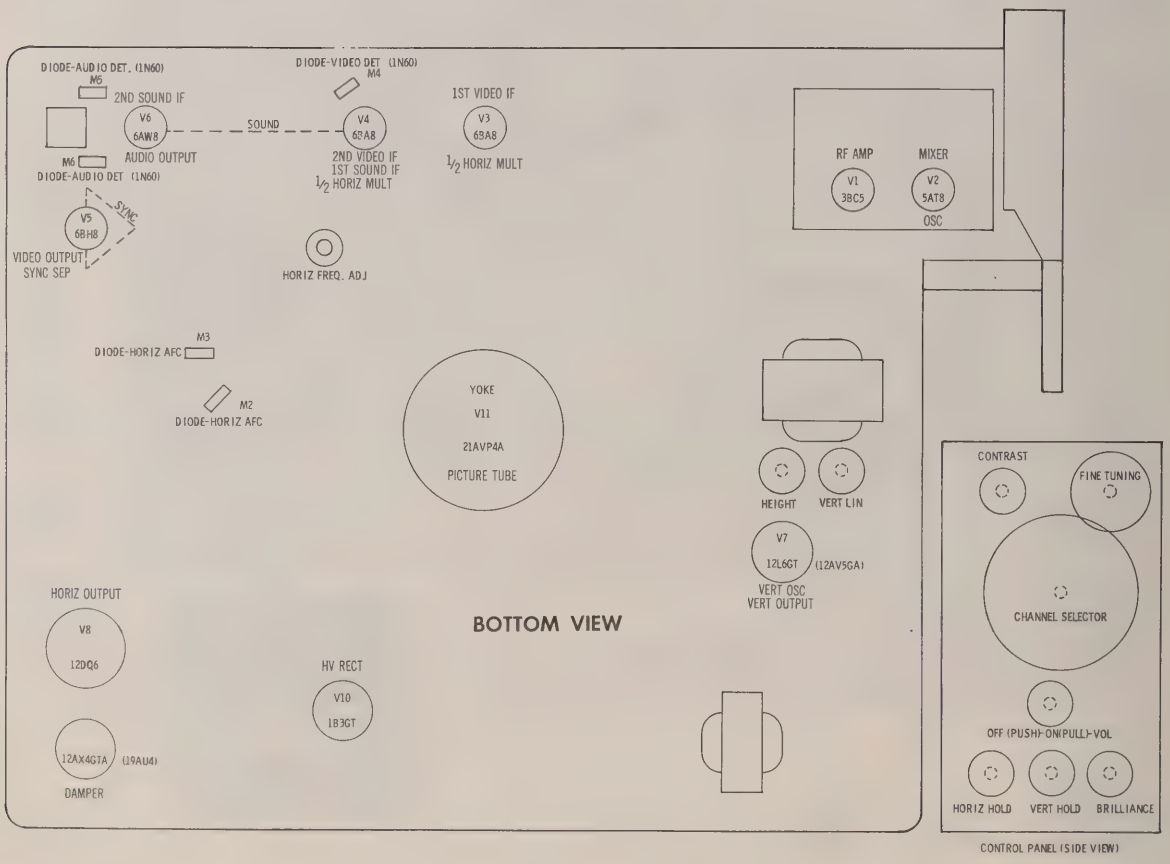
FIG. 3

CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1.6Meg	0Ω	11Ω	12Ω	†500Ω	†500Ω	0Ω		
V2	5AT8	15K	†6000Ω	0Ω	12Ω	13.5Ω	†1000Ω	†1000Ω	0Ω	235K
V3	6BA8	1200Ω	● 80K	†39K	15Ω	13.5Ω	0Ω	1.7Meg	†1000Ω	†1000Ω
V4	6BA8	1200Ω	2.2Meg	†10K	17Ω	15Ω	82Ω	1500Ω	†30Ω	†30Ω
V5	6BH8	0Ω	1.8Meg	†16K	20Ω	19Ω	● 5Ω	2.2Meg	†8200Ω	†3300Ω
V6	6AW8	0Ω	47K	†4700Ω	17Ω	19Ω	0Ω	● 25K	†22Ω	†280Ω
V7	12L6GT	TP	4Ω	†580Ω	● †27K	● 1.3Meg	TP	1.5Ω	0Ω	
V8	12DQ6	TP	20Ω	TP	590Ω	200K	TP	23Ω	0Ω	TOP CAP *9Ω
V9	12AX4GT	TP	NC	INF	NC	†30Ω	TP	26Ω	23Ω	
V10	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP *419Ω
V11	21AVP4A	0Ω	10Ω	Pin 10 *0Ω	Pin 11 ● †190K	Pin 12 1.5Ω				

† MEASURED FROM OUTPUT OF M1.
* MEASURED FROM PIN 3 OF V9.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

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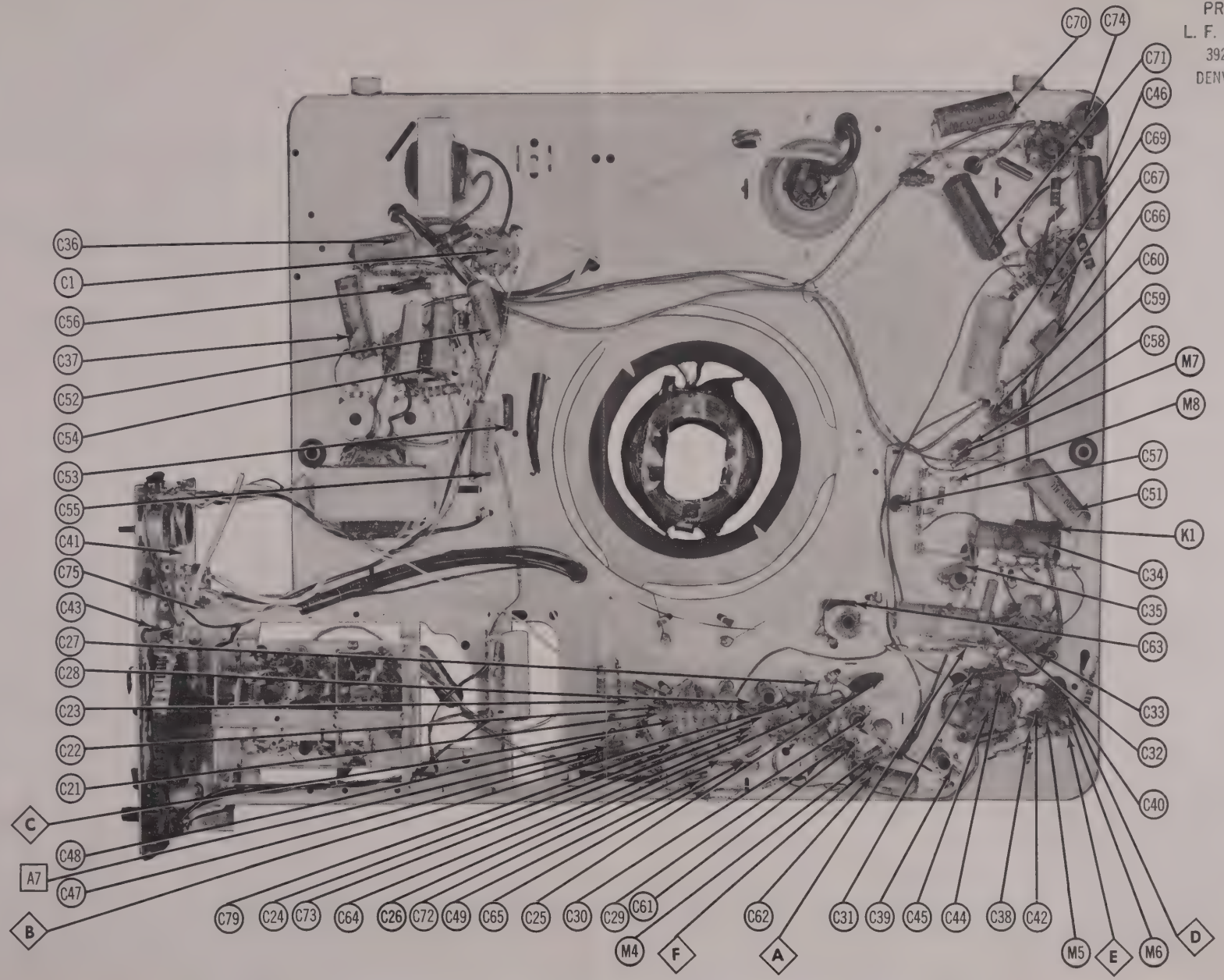
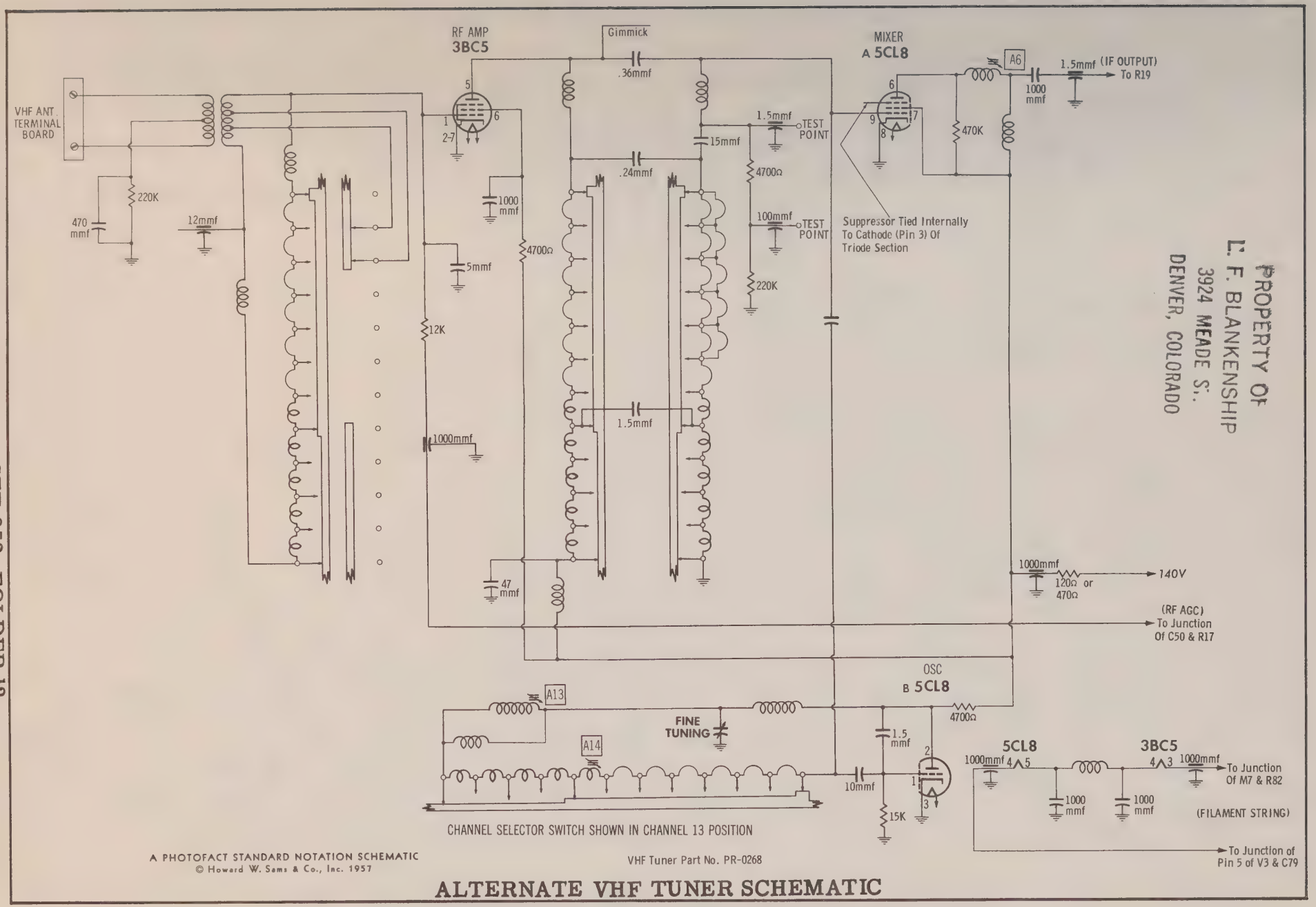


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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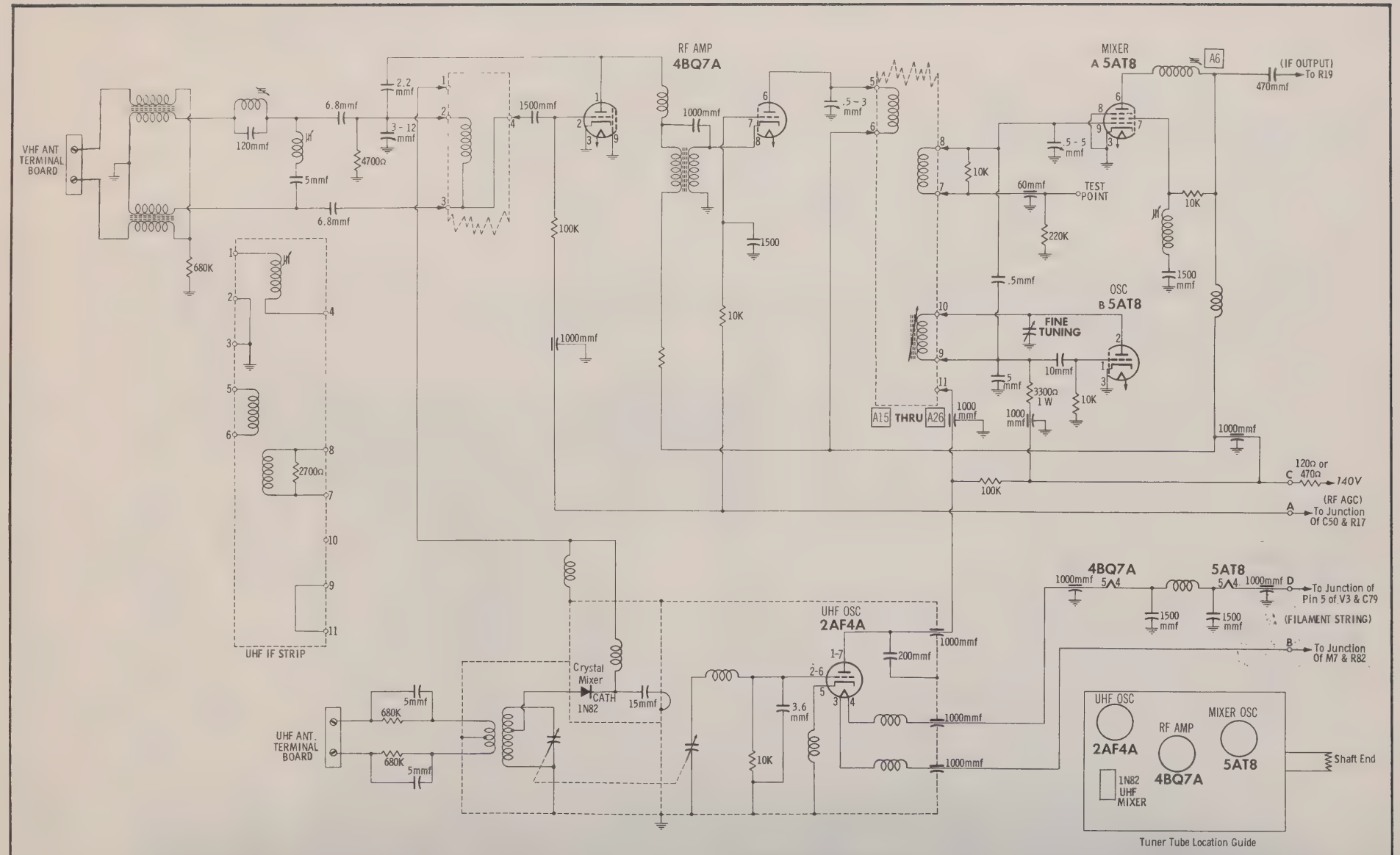
ALTERNATE VHF TUNER SCHEMATIC

MUNTZ MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82



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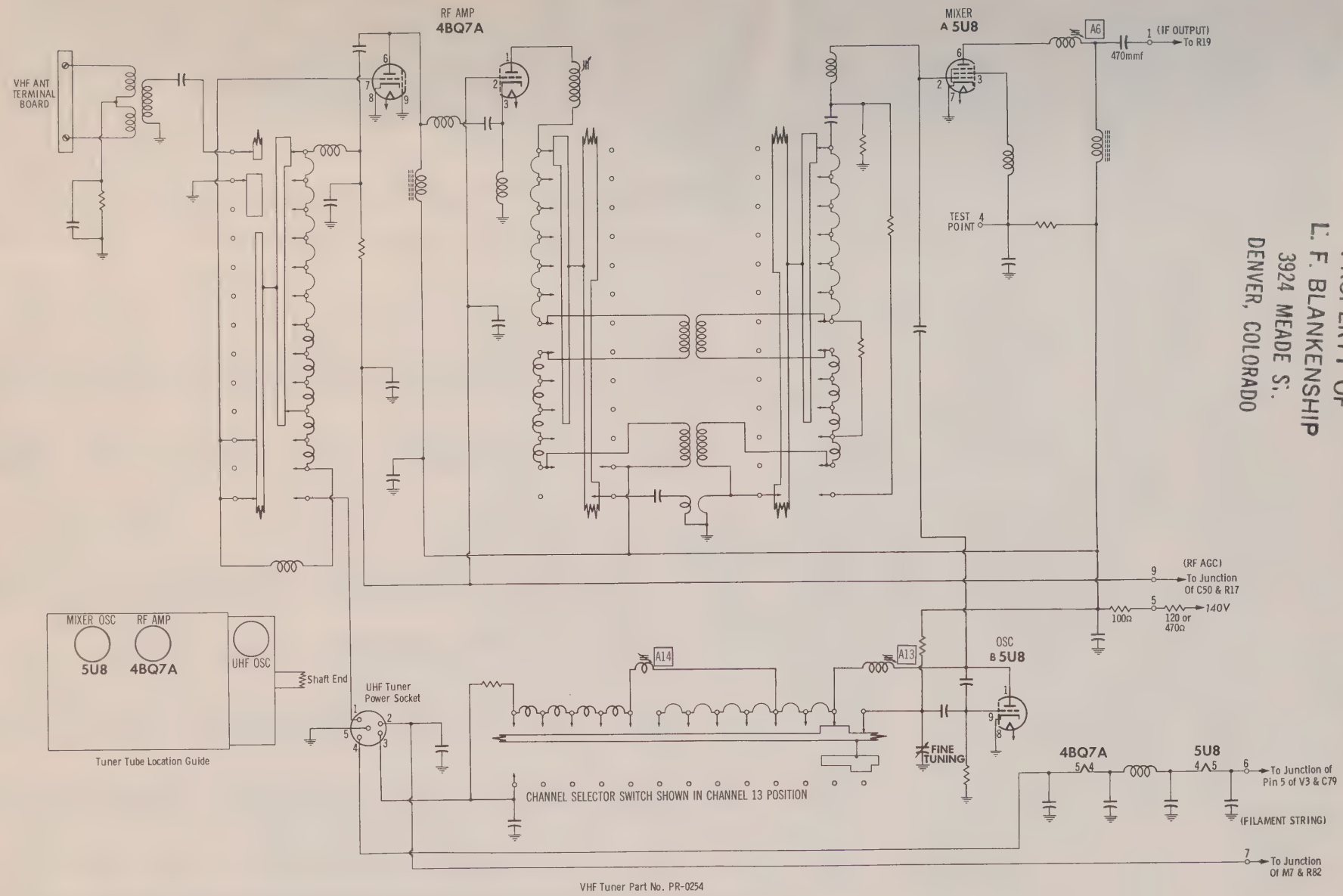
ALTERNATE VHF-UHF TUNER SCHEMATIC



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ALTERNATE VHF TUNER SCHEMATIC

MUNTZ MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	3BC5	Note 3
V2	Mixer - Osc.	5AT8	
V3	1st Video IF Amp. - Horiz. Mult.	6BA8	
V4	2nd Video IF Amp. - 1st Sound IF Amp. - Horiz. Mult.	6BA8	
V5	Video Output-Sync Sep.	6BH8	
V6	2nd Sound IF Amp. - Audio Output	6AW8	
V7	Vert. Osc. - Vert. Output	12L6GT	Note 1
V8	Horiz. Output	12DQ6	
V9	Damper	12AX4GT	Note 2
V10	HV Rectifier	1B3GT	

Note 1: Type 12AV6GA used in chassis above serial no. 196019, except TS Models
Note 2: Some versions use 12AU4 in this application.
Note 3: According to tuners used on pages 13, 13, 17, 18

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	MUNTZ PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V12	21AVP4A	21AVP4A ①	21AVP4A ② 21AVP4A, B ③	21AVP4A, B ②	① Aluminized ② Silver Screen "85"
	21XP4A	21AVP4 21XP4A ③ 21XP4	21AVP4 21XP4A ↓ 21XP4	21AVP4 21XP4A ② 21XP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MUNTZ PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	CE-0042	AFHS4-38-95		FP411.8		D-095 T-055	R2326*
B	100	150							
C	100	150							
D	10	75							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	18									
C3	8									
C4	9									
C5	1000			EF-001	MFT-1000				503C-D1	
C6	.27									
C7	1000			EF-001	MFT-1000				503C-D1	
C8	.68				TCZ-68		TCO-. 68			
C9	6.8			NP0-S16. 8	TCZ-6R8	C10V68C	TCO-6. 8	Z7-5568	5TCCB-V68	
C10	2									
C11	100									
C12	470			BPD-00047	DD-471	BYA10T47	KD-470	UC-5347	5GA-T47	
C13	.9									
C14	1000			EF-001	MFT-1000				503C-D1	
C15	20			NP0-S20	TCZ-20	C20Q2C	TCO-20	Z7-541	5TCC-Q1	
C16	2.5									
C17	1000	500	CC-0131	EF-001	MFT-1000				503C-D1	
C18	1000	500	CC-0131	EF-001	MFT-1000				503C-D1	
C19	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C20	1000	500	CC-0131	EF-001	MFT-1000				503C-D1	
C21	10	500	CC-0123							
C22	470	500	CC-0159	BPD-00047	DD-471	BYA10T47	KD-470	UC-5347	5GA-T47	
C23	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C24	82	500	CC-0157	N750-S182	TCN-82	C10Q82U	TC7-82			
C25	330	500	CC-0140	N750-S1330	TCN-330	C10T33U	TC7-330		5TCU-T33	
C26	47	500	CC-0156	N750-S147	TCN-47	C10Q47U	TC7-47	NT-5547	5TCU-Q47	
C27	470	500	CC-0159	BPD-00047	DD-471	BYA10T47	KD-470	UC-5347	5GA-T47	
C28	5000	500	CC-0080	BPD-005	DD-502	BYA6D5	GP-5000	DC525	5HK-D5	
C29	10000	500	CC-0167	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C30	10	500	CC-0154	N750-S1 10	TCZ-10	C10Q1C	TCO-10	Z7-541	5TCC-Q1	
C31	.022	100	CP-0052	BPD-02	DD-203	CUB2S22		GEM-2122	2TM-S22	
C32	.47	200	CP-0045	P288N-47		CUB2P47		GEM-2047	2TM-P47	Note 3
C33	100	500	CC-0153	BPD-0001	DD-101	L10T1	KD-100	UC-531	5GA-T1	
C34	.1	400	CP-0034	P488N-1	DF-104	CUB-4P1		GEM-401	4TM-P1	
C35	100	500	CM-0054	1468-0001		5WS71		MC230	1FM-31	Note 4
C36	.047	200	CP-0068	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C37	.047	600	CP-0064	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C38	7.5	500	CC-0153			C10V7C				
C39	50	500	CC-0124	BPD-00005	DD-500	L10Q5	KD-50	UC-545	5GA-Q5	
C40	150	500	CC-0158	N750-S1 150	TCT-150	C10T15U	TC7-150		5TCU-T15	
C41	5000	500	CC-0080	BPD-001	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C42	3300	500	CC-0068	BPD-0033	D6-332	BYA10D33	GP-3300	UC-5233	5HK-D33	Note 9
C43	3300	500	CC-0068	BPD-0033	D6-332	BYA10D33	GP-3300	UC-5233	5HK-D33	
C44	2000	500	CC-0160	BPD-002	DD-202	BYA10D2	GP-2000	DC522	5HK-D2	
C45	22	500	CC-0155							
C46	.1	200	CP-0028	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C47	.22	200	CP-0055	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C48	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C49	5000	500	CC-0080	BPD-005	DD-502	BYA10D5	CP-5000	DC525	5HK-D5	
C50	.1	200	CP-0036	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C51	.22	200	CP-0055	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C52	.047	200	CP-0068	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	Note 11
C53	.022	600	CP-0053	BPD-02	DF-203	CUB2S22		GEM-2122	2TM-S22	
C54	.022	600	CP-0053	BPD-02	DF-203	CUB6S22		GEM-6122	6TM-S22	
C55	.047	600	CP-0064	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	Note 8
C56	.0022	600	CPM-0100	BPD-0022	D6-222	CUB6D22		GEM-6222	6TM-D22	
C57	68	500	NP0-S1 68	TCZ-68	C10Q68C		TCO-68		5TCC-Q68	Note 10
C58	68	500	NP0-S68	TCZ-68	C10Q68C		TCO-68		5TCC-Q68	
C59	1000	500	CC-0117	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C60	2000	500	CC-0160	BPD-002	DD-202	BYA10D2	GP-2000	DC522	5HK-D2	Note 6
C61	1000	500	CC-0117	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C62	.1	200	CP-0028	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C63	.0047	600	CPM-0113	BPD-0047	DD-472	CUB6D47		GEM-6247	6TM-D47	
C64	470	500	CM-0048	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	Note 1
C65	100	500	CC-0163	BPD-0001	DD-101	L10T1	KD-100	UC-531	5GA-T1	
C66	680	500	CM-0049	1467-00068		5WS768			1FM-368	Note 7
C67	5000	500	CC-0080	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	Note 5
C68	5000	500	CC-0080	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	Note 5
C69	.47	200	CP-0045	P288N-47		CUB2P47		GEM-2047	2TM-P47	Note 3
C70	.1	400	CP-0034	P488N-1		CUB4P1		GEM-401	4TM-P1	
C71	.22	200	CP-0055	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C72	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	
C73	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C74A	5000	500		BPD-2X005	DDM-502	BYC6DD5	ED-005	DC525	5HK-2D47	Note 2
B	5000	500					ED-005	DC525		
C75	500	1500	CC-0133	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C76	.1	600	CP-0013	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	Note 5
C77	1000	500	CC-0131	BPD-001	DD-102	BYA6D1	KD-1000	DC521	5HK-D1	Note 5
C78	5000	500	CC-0080	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	Note 5
C79	1000	500	CC-0131	BPD-01	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	

Note 1: Some versions use 420MMF in this application.
Note 2: Some versions use 2 single 5000MMF (Part #CC-0080) in this application.
Note 3: In model 721TS above serial #190216 a . 22MFD is used in this application.
Note 4: Not used in model 721TS with serial number above 190216.
Note 5: Use only in chassis with serial #196458 and above.
Note 6: In chassis with serial #196287 and above a 5000MMF is used in this application. (Part #CC-0080)
Note 7: In chassis with serial #196287 and above a 470MMF is used in this application. (Part #CC-0159)
Note 8: In chassis with serial #196287 and above a . 1MFD is used in this application. (Part #CP-0013)
Note 9: A 5000MMF is used in Late Productions.
Note 10: Later productions may use a . 003MMF or a . 0033MMF in this application.
Note 11: In chassis beginning with serial #196400 a . 022MMF is used in this application. (Part #CP-0052)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MUNTZ PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	1/2	VC-0063	BT-71	A47F5-1Meg	Q19-137X	UT-443	Volume-Tap ⑤ 500K-Note 1, 2, 3
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A
R2A	600Ω	1/2	VC-0059	B-4	A47-750-S	Q11-105	U2	Contrast - Note 2 & 3
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	350K	1/2	VC-0061	AB-59	A47-500K-S	Q11-132	U50	Brilliance
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A
R4A	50K	1/2	VC-0062	B-11	A47-50K-S	Q11-123	U35	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R4A
R5A	50K	1/2	VC-0062	B-11	A47-50K-S	Q11-123	U35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R5A
R6A	350K	1/2	VC-0061	AB-59	A47-500K-S	Q11-132	U50	Vert. Lin.
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R6A
R7A	50K	1/2	VC-0062	B-11	A47-50K-S	Q11-123	U35	Vert. Size
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R7A

Note 1: Alternate volume control part no. VC-0060 used in models 721TS, 721TS/82, 721C, 721C/82, 721T and 721T/82.
Note 2: Alternate volume-contrast-switch control part no. VC-0056 used in models 721TS and 721TS/82.
Note 3: Alternate volume-contrast-switch control part no. VC-0058 used in models 721LTS and 721LTS/82.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MUNTZ PART No.	IRC PART No.	
R8	220K			BTS-220K	
R9	3900Ω			BTS-3900	
R10	470Ω			BTS-470	
R11	15K			BTS-15K	
R12	220K			BTS-230K	
R13	470K		RC-4703-18	BTS-470K	
R14	5600Ω		RC-5601-18	BTS-5600	
R15	15K			BTS-15K	
R16	15K			BTS-15K	
R17	1Meg		RC-1004-18		
R18	470Ω	1	RC-1203-11	BTA-470	Note 1
R19	15Ω		RC-015-18	BTS-15	Note 2
R20	8200Ω		RC-8201-18	BTS-8200	Note 3
R21	18Meg		RC-1805-18	BTS-18Meg	
R22	330K		RC-3303-18	BTS-330K	
R23	1. 5Meg		RC-1504-18		
R24	5600Ω		RC-5601-18		Note 4
R25	47K		RC-4702-18	BTS-47K	
R26	1000Ω	1	RC-1000-11	BTA-1000	Note 5
R27	1500Ω		RC-1501-18	BTS-1500	
R28	18K		RC-1802-18		
R29	82Ω		RC-082-18	BTS-82	
R30	22K		RC-2202-18		
R31	5600Ω		RC-5601-18	BTS-5600	
R32	1200Ω		RC-1201-18	BTS-1200	
R33	680K		RC-6803-18	BTS-680K	Note 6
R34	2. 2Meg		RC-2204-18	BTS-2. 2Meg	
R35	3300Ω	3	RC-3301-12	BTS-3300	
R36	150K		RC-1503-18	BTS-150K	
R37	8200Ω		RC-8201-18	BTS-8200	
R38	47K		RC-4702-18	BTS-47K	
R39	4700Ω		RC-4701-18	BTS-4700	
R40	470K		RC-4703-18	BTS-470K	Note 21
R41	470K		RC-4703-18	BTS-470K	Note 21
R42	100K		RC-1003-18	BTS-100K	
R43	4700Ω		RC-4701-18	BTS-4700	Note 3
R44	2. 2Meg		RC-2204-18	BTS-2. 2Meg	Note 16
R45	330K		RC-3303-18	BTS-330K	
R46	1. 2Meg		RC-1204-18	BTS-1. 2Meg	
R47	100K		RC-1003-18	BTS-100K	Note 18

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MUNTZ PART No.	IRC PART No.	
R48	27K		RC-2702-18	BTS-27K	Note 17
R49	27K		RC-2702-18	BTS-27K	Note 7
R50	150K		RC-1503-18	BTS-150K	
R51	1200Ω		RC-1201-18	BTS-1200	Note 19
R52	47K	1	RC-4702-11	BTA-47K	
R53	10K		RC-1002-18	BTS-10K	
R54	100Ω	2	RC-100-12	BTB-100	Note 22
R55	680Ω		RC-680-18	BTS-680	Note 8
R56	2200Ω		RC-2201-18	BTS-2200	
R57	150Ω		RC-150-18		Note 3
R58	8200Ω		RC-8201-18		
R59	1. 2Meg		RC-1204-18		
R60	4700Ω		RC-4701-18		
R61	1. 2Meg		RC-1204-18		
R62	1Meg		RC-1003-18		
R63	100K		RC-1003-18		
R64	10K		RC-1002-18	BTS-10K	
R65	27K		RC-2702-18		
R66	1200Ω		RC-1201-18		
R67	68K		RC-6802-18	BTS-68K	
R68	470K		RC-4703-18		Note 9
R69	3. 9Meg		RC-3904-18	BTS-3. 9Meg	
R70	39K		RC-3902-18		
R71	8200Ω		RC-8201-18		
R72	10K		RC-1002-18		
R73	1Meg		RC-1004-18		
R74	180K 5%		RC-1803-18		
R75	22K		RC-2202-18	BTS-22K	
R76	470K				Note 3,10,15
R77	560Ω	1	RC-560-11	BTA-560	
R78	4700Ω		RC-4701-18		
R79	2. 2Ω		RW-042-18	BW½-2. 2	
R80	470Ω	7	RW-470-17		Note 3
R81	22Ω		RC-022-18	BTS-22	
R82	12Ω	7	RW-012-17	PW7-15	
R83	56Ω	25			Note 11
R84	5Ω				Note 12
R85	47K	1	RC-4702-11	BTA-47K	
R86	18Ω		RC-018-18	BTS-18	Note 13
R87	2700Ω		RC-2701-18	BTS-2700	Note 14
R88	39K		RC-3902-18	BTS-39K	Note 20

Note 1: A 120Ω resistor (Part #RC-1203-18) used in some early models with serial numbers before 190971.
Note 2: Not used in some versions.
Note 3: Not used in models 721TS and 721TS/82.
Note 4: A 8200Ω resistor (Part #RC-8201-18) used in models 721TS and 721TS/82.
Note 5: Not used in some early models with serial numbers before 190971.
Note 6: A 470K resistor is used in models 721TS and 721TS/82 with serial numbers 190216 and above, also in models with serial numbers 196458 and above. (Part #RC-4703-18)
Note 7: A 39K resistor (Part #RC-3902-18) used in models 721TS and 721TS/82.
Note 8: A 2200Ω resistor (part #RC-2201-18)used in Models 721TS, 721TS/82.
Note 9: Due to the variations of the horiz. hold control the 470K resistor (R68) may be removed.
Note 10: A 440K resistor used in some 25CW models.
Note 11: A 54Ω ② 25W resistor used in early models using a 19AU4 damper tube.
Note 12: This resistor is a continuous duty current 1. 35 amp. , it blows on 2. 5 amp. in 1 minute or less.
Note 13: Used in models 721TS and 721TS/82 only.
Note 14: This resistor used in models with serial numbers 196458 and above.
Note 15: A 330K resistor (Part #RC-3308-18) used in all models with serial numbers 196458 and above except in 721TS models.
Note 16: A 1. 5Meg resistor (Part #RC-1504-18) used in all models with serial numbers 196287 and above.
Note 17: A 10K resistor (Part #RC-1002-18) used in all models with serial numbers 196287 and above.
Note 18: A 47K resistor (Part #RC-4702-18) used in all models with serial numbers 196287 and above.
Note 19: A 1000Ω resistor (Part #RC-1000-18) used in all models with serial numbers 196287 and above.
Note 20: This resistor used in models with serial numbers 196287 and above.
Note 21: A 180K resistor used in late productions.
Note 22: In chassis beginning with serial numbers 196400 a 1000Ω 1W resistor is used in this application. (Part #RC-1001-11)

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		MUNTZ PART No	Halldorson PART No	Merit PART No.	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Osc. & Output Trans.	TO-0045 TO-0051 ①							
T2	Horiz. Output Trans.	TO-0050 TO-0052 ②	FB419③*§	HV0-38③ *§	235TI③*§	X094③*§	A-8291*	FLY-16 ③ *§	D-50③*§
T3A	Yoke(70°)Horiz(25MH)	LC-0082	DF603⑦⑧	MDF-74	214DI⑦⑧	Y70F25/3	DY-10A⑦	Y-U⑦⑧	Y-20⑦⑧
B	Vert(3.5MH)	LC-0099 ④ PR-0275 ⑤ PR-0234 ⑥		⑦⑧		⑦⑧	⑧		

① Used in all models above serial no. 196019 except 721TS and 721TS/82.
② Used in model 721TSP only.
③ Drill new mounting hole(s).
④ Alternate yoke.
⑤ Rear cover and centering device for LC-0082 yoke.
⑥ Rear cover and centering device for LC-0099 yoke.
⑦ Use original rear cover and centering device.
⑧ Use original yoke damping network.
§ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	9	9	9	9	7	9	9
	3	7	7	7	7	4	7	7
	2	NC See Note ③	NC See Note ③	NC See Note ③	NC See Note ③	T	NC See Note ③	NC See Note ③
	1	1	1	1	1	1	1	1
Special Notes →		③	③	③	③		③	③

③ Install new damping network consisting of 50-100MMF ⑨ 2KV and 1000Ω ½ watt connected in series across horiz. yoke terms #3 and #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MUNTZ PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	6K	3-4Ω	TO-0049-1	Z1007	A-3019	A-3877①	26S49	S-5Z	

① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MUNTZ PART No.	QUAM PART No.		
SP1	6"	PM	3-4Ω	SK-0026 ①	6A1		① Used in 721C series models.
	5"	PM	3-4Ω	SK-0025-1 ②	5A1		② Used in 721T series models.
	4"	PM	3-4Ω	SK-0022-3 ③			③ Used in 721TS, LTS, TSP series models.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st IF Coupling Coil	0Ω		LC-0096				
L2	1st Video IF	0Ω		LC-0087				
L3	2nd Video IF	0Ω	0Ω	LC-0089				
L4	1st Sound IF	. 9Ω		LC-0095				
L5	3rd Video IF	. 2Ω	. 2Ω	LC-0090				
L6	2nd Sound IF	1Ω		LC-0095-1				
L7	RF Choke	9Ω		LC-0087-11	19-3100	TV-181	6112	100 Microhenries
L8	Series Peaking Coil	9Ω		LC-0101-1	19-3125		6153	120 Microhenries-Note 1
L9	Shunt Peaking Coil	9Ω		LC-0101-1	19-3125		6153	120 Microhenries-Note 2
L10	Series Peaking Coil	. 5Ω		LC-0091				4. 7 Microhenries
L11	Series Peaking Coil	15Ω		LC-0101-2	19-3250*	TV-185*	6130*	270 Microhenries; Wound on 18K resistor
L12	Shunt Peaking Coil	7Ω		LC-0101-1	19-3125		6153	120 Microhenries Note 2
L13	4. 5MC Trap	1Ω		LC-0095-1				4. 7 Microhenries
L14	RF Choke	. 5Ω		LC-0091				
L15	Discriminator	3. 7Ω	3. 7Ω	LC-0076				
L16	RF Choke	. 9Ω		LC-0098				10 Microhenries
L17	RF Choke	8Ω		LC-0097				2 Microhenries -Note 2
L18	RF Choke			LC-0094				Note 3
L19	RF Choke			LC-0080				1 Microhenry - Note 4

Note 1: In 721TS and 721TS/82 models with serial numbers 190216 and above, L8 is 270 Microhenries, paralled with a 18K resistor (Part #LC-0101-2).
Note 2: Not used in 721TS and 721TS/82 models with serial numbers 190216 and above.
Note 3: Not used in some versions.
Note 4: L19 is used in models with serial numbers 196458 and above.
* Parallel with 18K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MUNTZ PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L20	48Ω		LO-0077	19-1576	TV-163	6210			HS-5	14-22 Millihenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	MUNTZ PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No.	Triad PART No.	
L21	. 270A	22. 5Ω	. 75HY	LC-0081	C5041 ①		C-2328 ①			

① Drill new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MUNTZ PART No.	REPLACEMENT DATA
K1	Sync Take-off	150MMF, 5000MMF, 330K, 15K 1.8Meg	PAK-0100	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						
	CURRENT (Measured)	MUNTZ PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.270A	CX-0033 ① SR-0008 ③	1236AH ③	1N1007 ④	RS300SL ③	6S300 ③	6Q4 ③	300 ③
		SR-0005 ②	1236AH ③	1N1007 ④	RS300SL ③	6S300 ③	6Q4 ③	300 ③
M2		SR-0004 ③ ⑤			1T1 ③			
M3		SR-0004 ③ ⑤			1T1 ③			

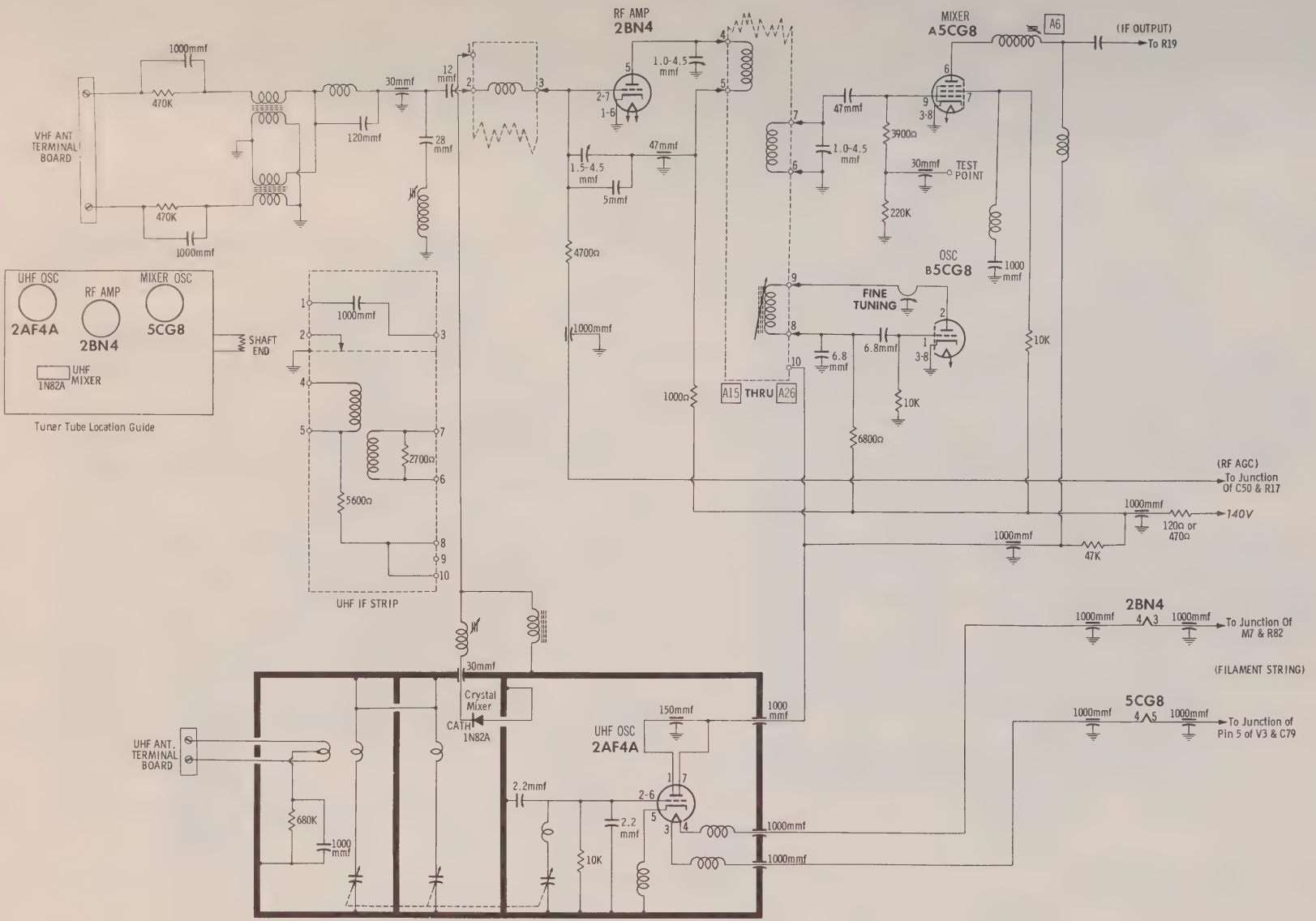
① Germanium type used in later versions of 721C, T, LTS, TSP series models.
② Selenium type used in earlier versions of 721C, T, LTS, TSP series models and all versions of 721TS series models.
③ Selenium type.
④ Germanium type.
⑤ Matched pair.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		MUNTZ PART No.	SYLVANIA PART No.	
M4	1N60	CX-0031	1N60	Video Det. (Pigtail)
M5	1N60	CX-0031	1N60	Discriminator (Pigtail) (Matched pair)
M6	1N60	CX-0031	1N60	Discriminator (Pigtail) (Matched pair)

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M7	Pilot Lamp	LS-0004-3	Type #1847
M8	Tuner	PR-0264	VHF
	Tuner	PR-0254	UHF-VHF
	Tuner	PR-0263	UHF-VHF
	Tuner	PR-0253	UHF-VHF
	Tuner	PR-0276	UHF-VHF
	Tuner	PR-0268	VHF
M9	Centering Device		
M10	Ion Trap	PR-0229	
	Cabinet	CW-0066	Table-Metal (Pebble Tan) Models 721TS, 721TS/82.
	Cabinet	CW-0079	Table-Metal (Specify Color) Models 721TSP, 721TSP/82.
	Cabinet	CW-0060	Table-Metal (Pebble Tan) Models 721LTS, 721LTS/82.
	Cabinet	CW-0074	Table-Wood (Mahogany) Models 721TM, 721TM/82.
	Cabinet	CW-0074-2	Table-Wood (Blonde) Models 721TB, 721TB/82.
	Cabinet	CW-0072-2	Consolette (Mahogany) Models 721CMS, 721CMS/82.
	Cabinet	CW-0072-2D	Consolette (Mahogany) Models 721CMD, 721CMD/82.
	Cabinet	CW-0072-4	Consolette (Blonde) Models 721CBS, 721CBS/82.
	Cabinet	CW-0072-4D	Consolette (Blonde) Models 721CBD, 721CBD/82.
	Knob	KB-0055-3	Fine Tuning (Tan) Models 721LTS, 721TS
	Knob	KB-0056-3	Channel Selector (Tan) Models 721LTS, 721TS.
	Knob	KB-0058-3	On/Off-Volume (Tan) Models 721LTS, 721LTS/82, 721TS, 721TS/82,
	Knob	KB-0060-3	UHF Selector -VHF Fine Tuning (Tan) Models 721TS/82, 721LTS/82.
	Knob	KB-0061-3	VHF Channel Selector (Tan) Models 721LTS/82, 721TS/82.
	Knob	KB-0062-3	VHF Fine Tuning (Tan) Models 721LTS/82, 721TS/82.
	Knob	KB-0063-3	Contrast (Tan) Models 721LTS, 721LTS/82, 721TS, 721TS/82.
	Knob	KB-0064-3	Horiz. Hold, Vert. Hold and Brightness (Tan) Models 721LTS, 721LTS/82, 721TS, 721TS/82.
	Knob	KB-0066-3	UHF Channel Selector (Tan) Models 721C/82, 721LTS/82, 721T/82, 721TS/82, 721TSP/82.
	Knob	KB-0067-3	Channel Selector, 13 Position (Tan) Models 721C/82, 721LTS/82, 721T/82, 721TS/82, 721TSP/82.
	Knob	KB-0068-3	Fine Tuning; Models 721LTS/82, 721TS/82, 721TSP/82.
	Knob	KB-0069-3	Horiz. Hold, Vert. Hold and Brightness; Models 721C, 721C/82, 721T, 721T/82, 721TSP, 721TSP/82.
	Knob	KB-0071-3	VHF Channel Selector; Models 721C, 721T.
	Knob	KB-0071-4	VHF Channel Selector; Models 721C, 721T, 721TSP.
	Knob	KB-0072-3	On/Off-Volume; Models 721C, 721C/82, 721T, 721T/82, 721TSP, 721TSP/82.
	Knob	KB-0073-3	Fine Tuning, Contrast; Models 721C, 721C/82, 721T, 721T/82, 721TSP, 721TSP/82.
	Safety Glass	WG-0019	Models 721TS, 721TS/82, 721TSP, 721TSP/82.
	Safety Glass	WG-0019-1	Models 721LTS, 721LTS/82.
	Safety Glass	WG-0019-2	Models 721C, 721C/82, 721T, 721T/82.
	Safety Glass	WG-0020-2	(Tinted) Models 721CMD, 721CMD/82, 721CBD, 721CBD/82.
	Mask	ES-0066	(Green) Models 721TS, 721TS/82.
	Mask	ES-0066-1	(Gold) Models 721TSP, 721TSP/82.
	Mask	ES-0057	(Green) Models 721LTS, 721LTS/82.
	Mask	ES-0068	(Gold) Models 721C, 721C/82, 721T, 721T/82.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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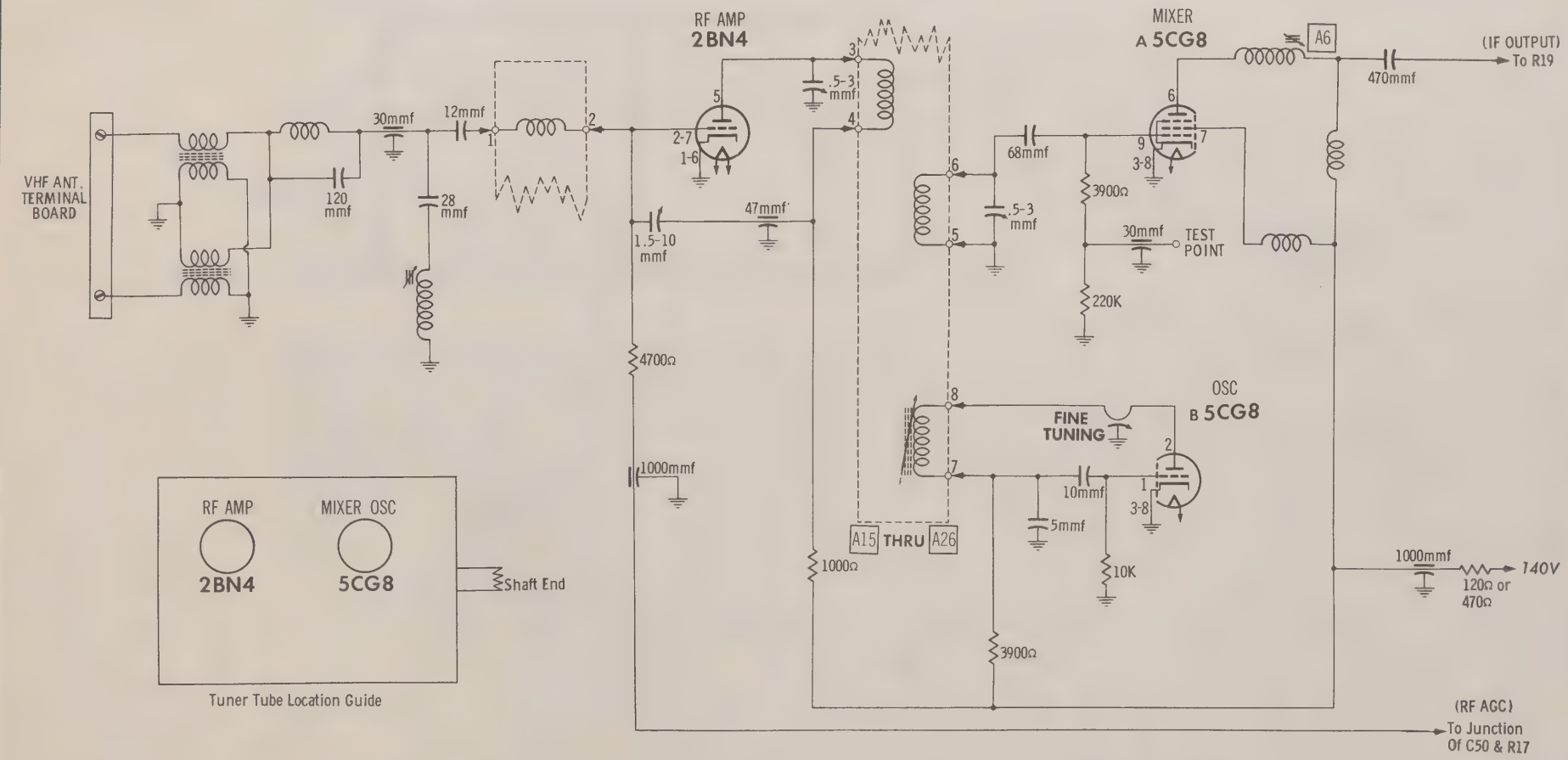
UHF-VHF Tuner Part No. PR-0276

ALTERNATE VHF-UHF TUNER SCHEMATIC

MUNTZ MODELS 721CBD, CBD/82, CBS, CBS/82, CEA, CEA/82, CMD, CMD/82, CMS, CMS/82, CPB, CPB/82, CPM, CPM/82, CW, CW/82, LTS-B, LTS-B/82, LTS-M, LTS-M/82, TB, TB/82, TM, TM/82, TS, TS/82, TSP-BK, TSP-BK/82, TSP-BL, TSP-BL/82, TSP-RD, TSP-RD/82, TSP-WH, TSP-WH/82



VHF Tuner Part No. PR-0263

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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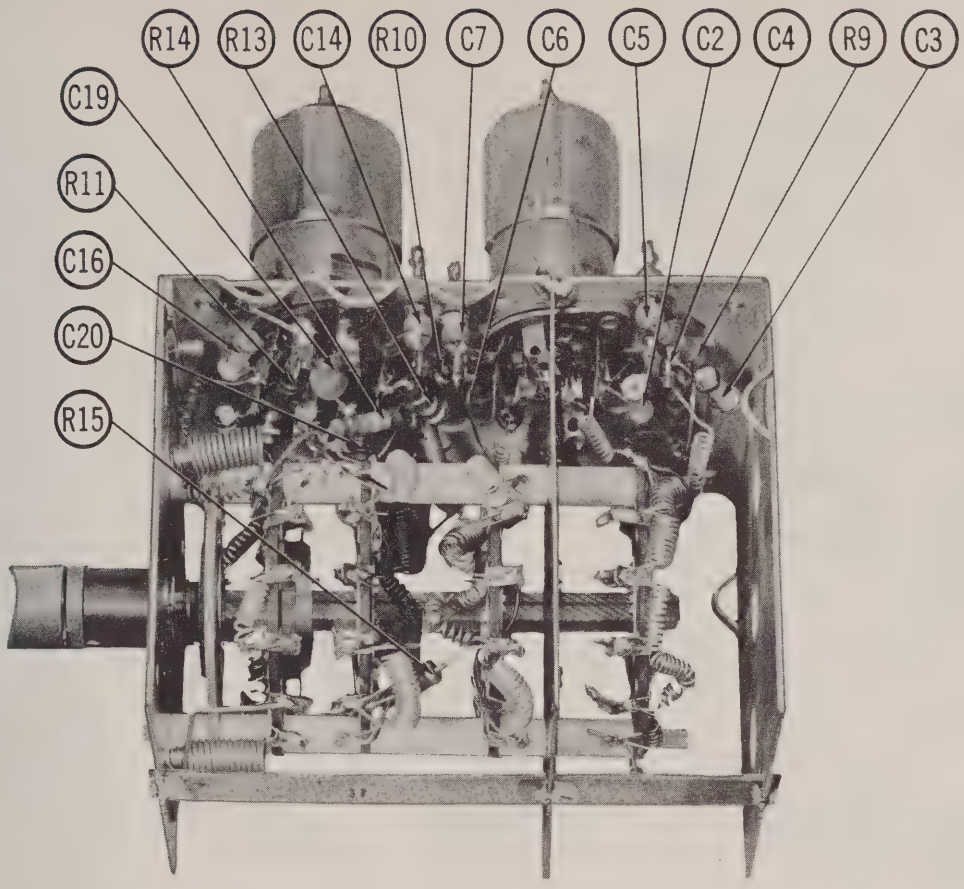
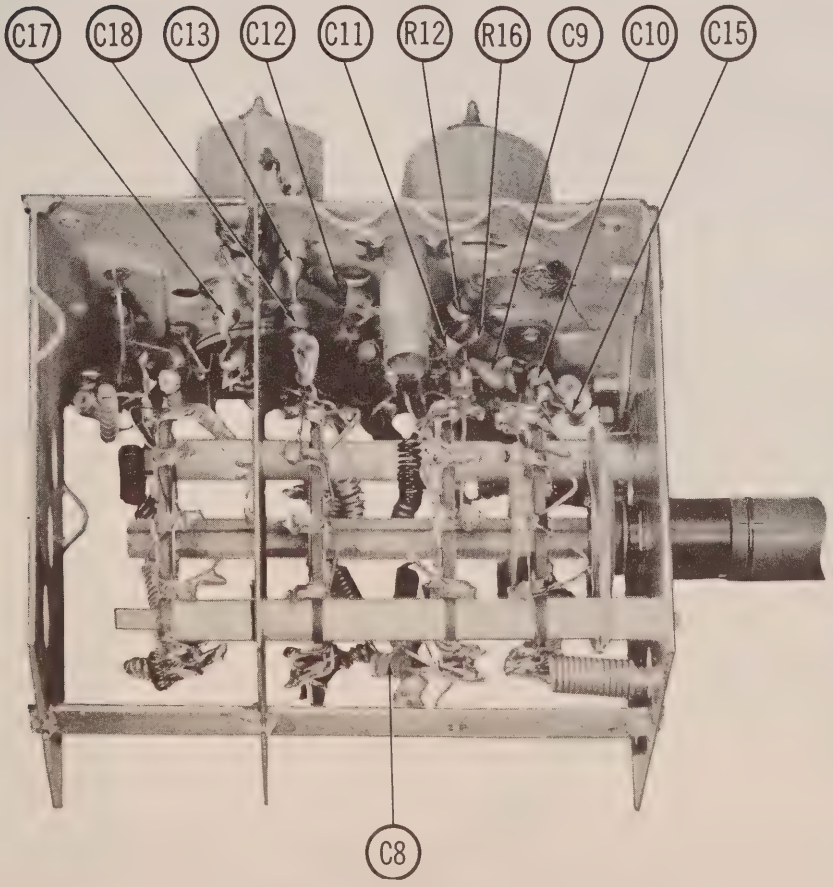
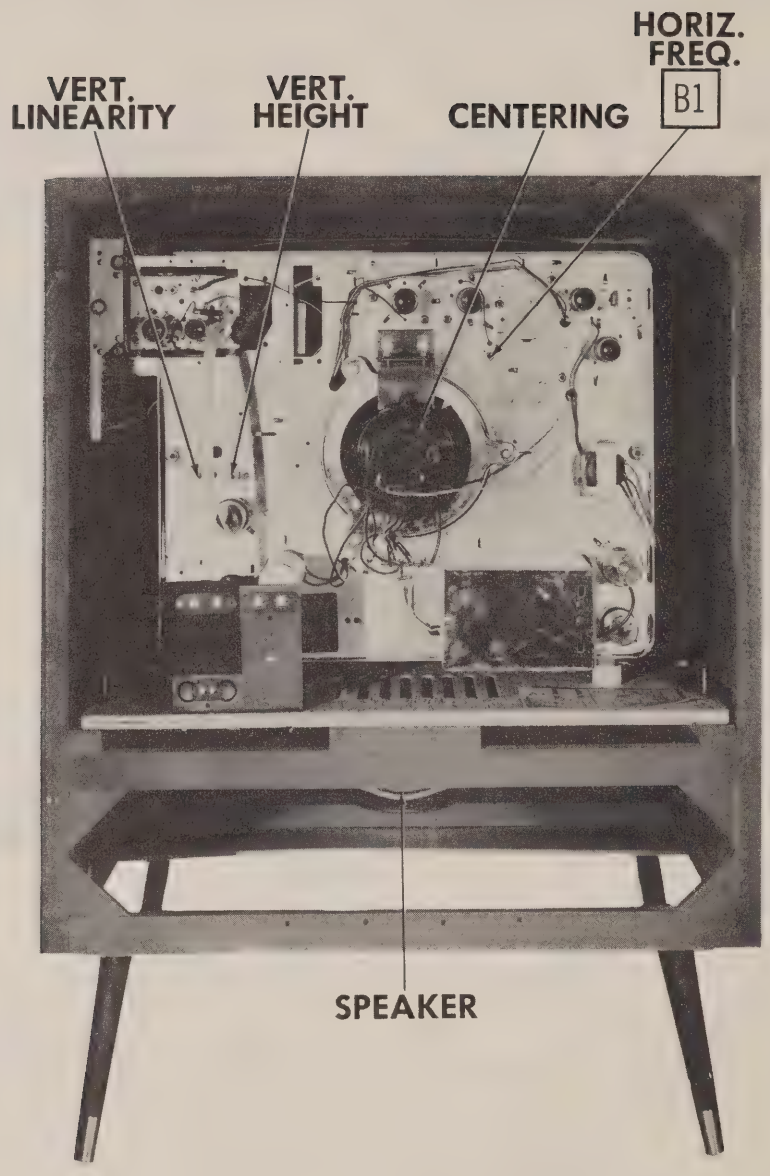
ALTERNATE VHF TUNER SCHEMATIC



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Allow the receiver a few minutes to warm up.

1. Tune the receiver properly and the contrast for a picture below an excessive contrast condition.
2. Place a clip lead across the Horiz. Frequency coil (L20).
3. Place a clip lead from point (F) to chassis.
4. Adjust the horizontal hold control (R5) until a single picture is attained.
5. Remove the short from L20. Adjust the horizontal frequency slug (B1) with the slug entering the coil from the chassis side until a single picture is attained, then turn B1 1/4 turn counter clockwise for final setting of the coil.
6. Remove the short from point (F), and the picture should snap into sync.
7. Turn the horizontal hold control fully clockwise, the turn slowly counter clockwise until the picture falls into sync. With this setting of the horizontal hold control, the picture will remain in sync regardless of the signal level.
8. Measure the DC voltage between point (F) and chassis. It should measure 1 to 2 volt positive if the circuit is operating properly.

SILVERTONE MODELS 7010, 7011, 7012 (Ch. 132.40000)

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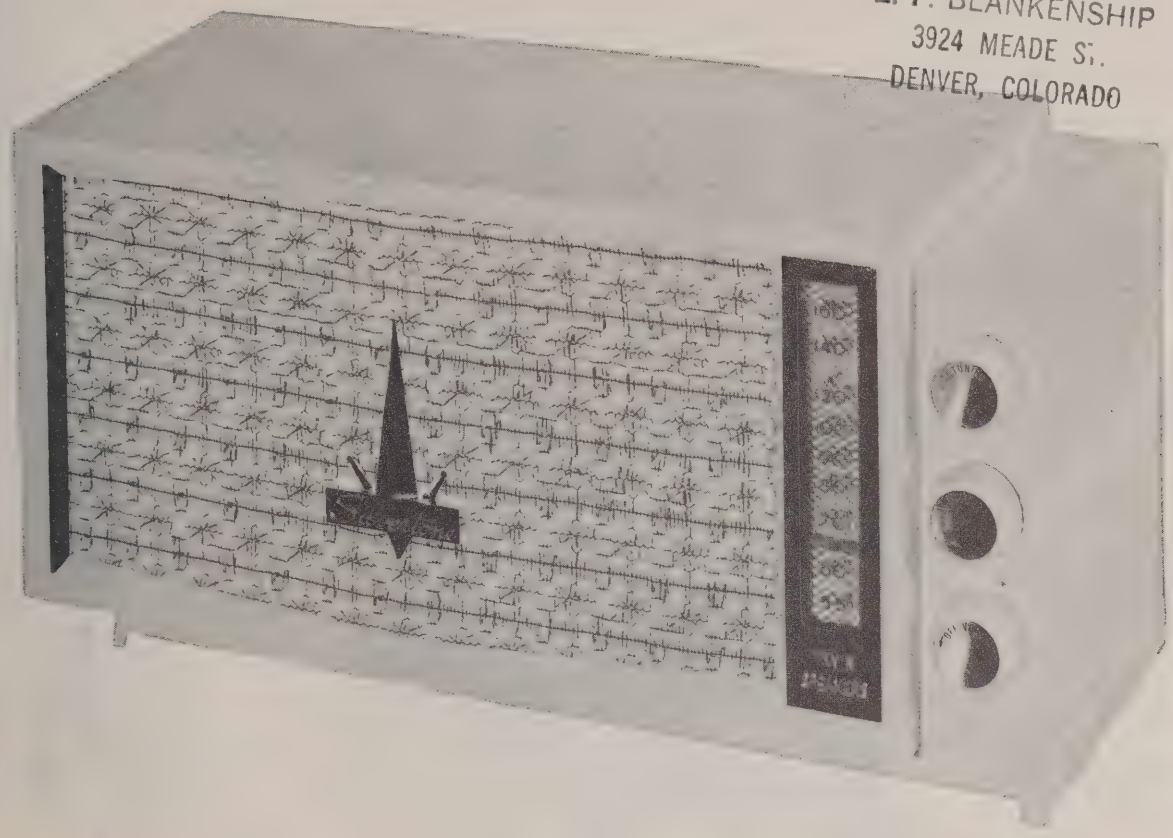
DENVER, COLORADO

SILVERTONE MODELS 7010, 7011, 7012 (Ch. 132.40000)



SILVERTONE MODELS 7010, 7011, 7012 (Ch. 132.40000)

TRADE NAME	Silvertone Models 7010, 7011, 7012 (Ch. 132. 40000)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400% Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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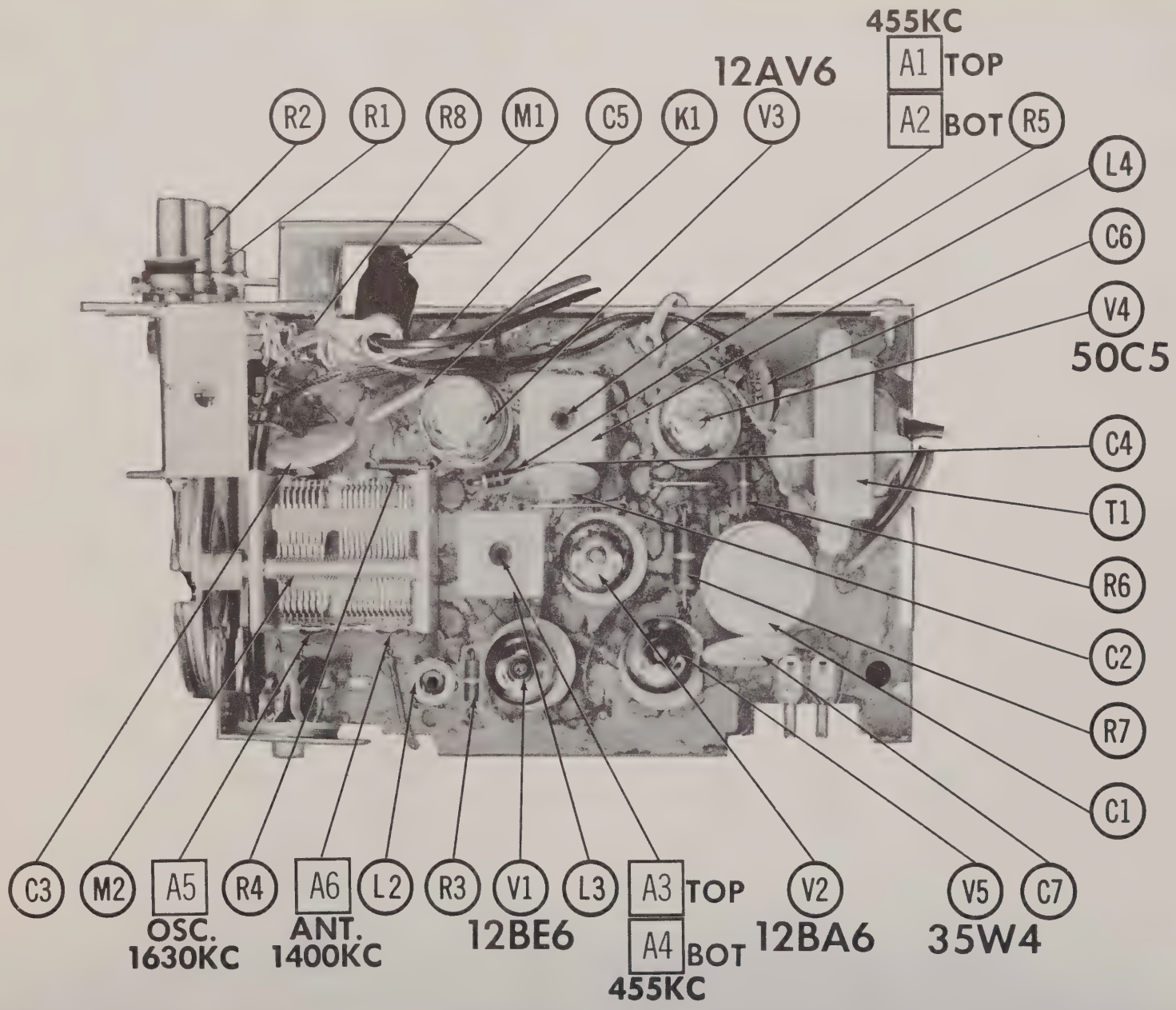


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43711-1	AFH3-77	CO560	FP311	TMT-62	T-295	TVL-3426.7
B	▲30	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	
C3	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	
C4	150		43957-2	BPD-00015	DD-151	G046	ED-150	UC-5315	5GA-T15	
C5	2000		43674-4	BPD-002	DD-202	K072	GP-2000	DC522	5GA-D2	
C6	10000		43674-1	BPD-01	DD-103	K082	GP-10000	DC511	5HK-S1	
C7	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	43745	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	KB-1	
R2A	500K	½	43097	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	NOTES
R3	22K		43687-223	BTS-22K	
R4	2.2Meg		43687-225	BTS-2.2Meg	
R5	47K		43687-473	BTS-47K	
R6	120Ω		43689-121	BTS-120	
R7	1200Ω	1	43688-122	BTA-1200	
R8	330K		43687-334	BTS-330K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2900Ω	3-4Ω	42700-13	Z1004 ①	A-3025	A-3332	26S58 ①	S-12X	① Fabricate mtg.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	44088 ①	5A1Z8 ①	① Parallel & phase.
SP2	4"	PM	6-8Ω	44088 ①	5A1Z8 ①	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	43908-1				Includes Cabinet Back
L2	Osc. Coil	43644-1				
L3	Input IF	43669-1		BC-356		
L4	Output IF	43669-1		BC-357		

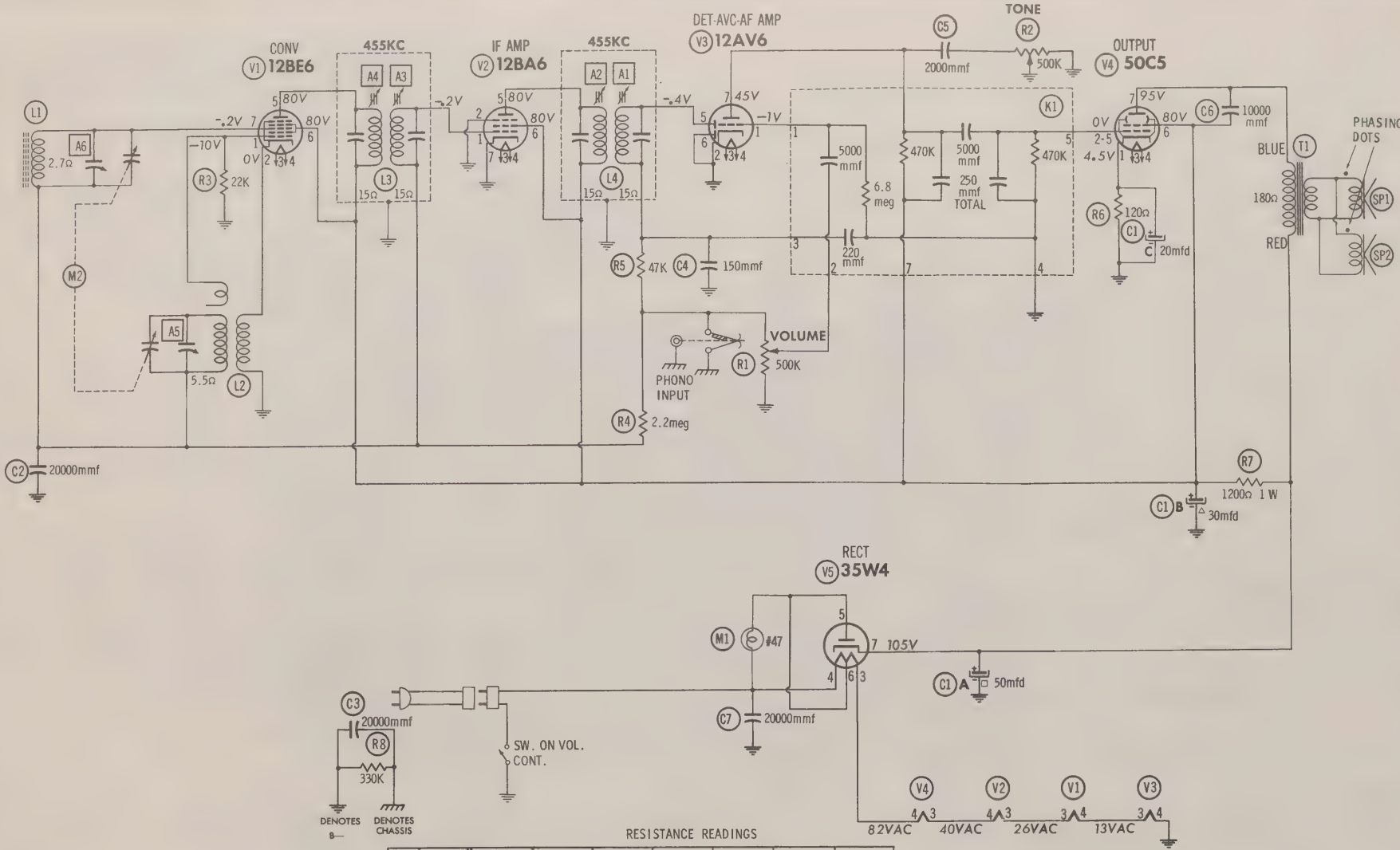
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Det-Audio Net.	5000MMF, 2000MMF, 250MMF, 220MMF, 6.8Meg, .47Meg, .47Meg		Aerovox PA-511 Centralab PCT-157 Sprague DT-4

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Dial Lamp	19351	#47
M2	Tuning Cap.	43987	2 Gang
	Cabinet	43911-48	Brown, Model 7010
	Cabinet	43911-17	Ivory, Model 7011
	Cabinet	43911-23	Coral, Model 7012
	Knob	44000-48	Volume, Brown
	Knob	44000-17	Volume, Ivory
	Knob	44000-23	Volume, Coral
	Knob	44001-48	Tone, Brown
	Knob	44001-17	Tone, Ivory
	Knob	44001-23	Tone, Coral
	Knob	44002-48	Tuning, Brown
	Knob	44002-17	Tuning, Ivory
	Knob	44002-23	Tuning, Coral
	Pointer	43915	
	Crystal	43686	Dial

SILVERTONE MODEL 7010 (Ch. 132, 40000)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	26Ω	13Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	26Ω	38Ω	†1200Ω	†1200Ω	0Ω
V3	12AV6	6.8Meg	0Ω	13Ω	0Ω	550K	0Ω	†470K
V4	50C5	120Ω	470K	38Ω	85Ω	470K	†1200Ω	†180Ω
V5	35W4	NC	NC	85Ω	120Ω	115Ω	115Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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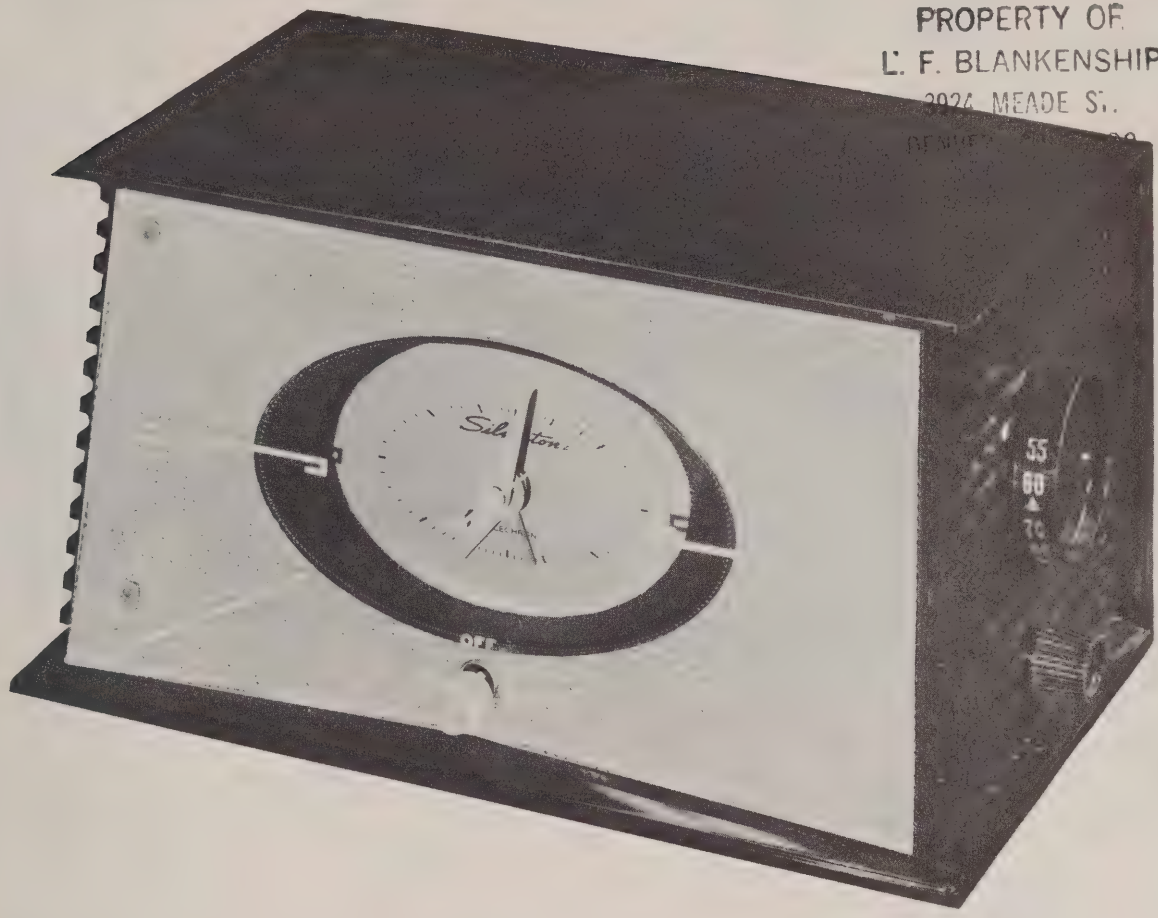
SILVERTONE MODEL
7018 (Ch. 528.46500)



SILVERTONE MODEL
7018 (Ch. 528.46500)

TRADE NAME	Silvertone Model 7018 (Ch. 528. 46500)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Four)	Types 12BE6 Converter, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .31 Amp. @ 117 Volts AC (27 Watts Without Clock)
TUNING RANGE—BROADCAST	535KC - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A3	"
3.	50MMF	High side to junction of C6 and L1. Low side to B-.	1400KC	Tune to 1400KC signal.	"	A4	"

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	Det-AVC-AF Amp.	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	18-21-2	PRS150/25V	BBRT5315C	TCT3107	TDLT-15	FMT-327	TVA-3430
B	30	150		5030/20					
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	. 02	400	16-20343	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C3	5000		15-50216	BPD-005	DD-502	BYA6D5	GP-5000	DC525	5HK-D5	
C4	. 05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C5	. 02	400	16-20343	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C6	6. 8		20-27-0	NP0-SI6. 8	TCZ-6R8	C10V68C	TCO-6. 8	ZT-5568	5TCCB-V68	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	24-237	AB-69	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft			AK-3	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	22K		60-22302	BTS-22K	
R3	2. 2Meg		60-22502	BTS-2. 2Meg	
R4	100Ω			BTS-100	Note 1

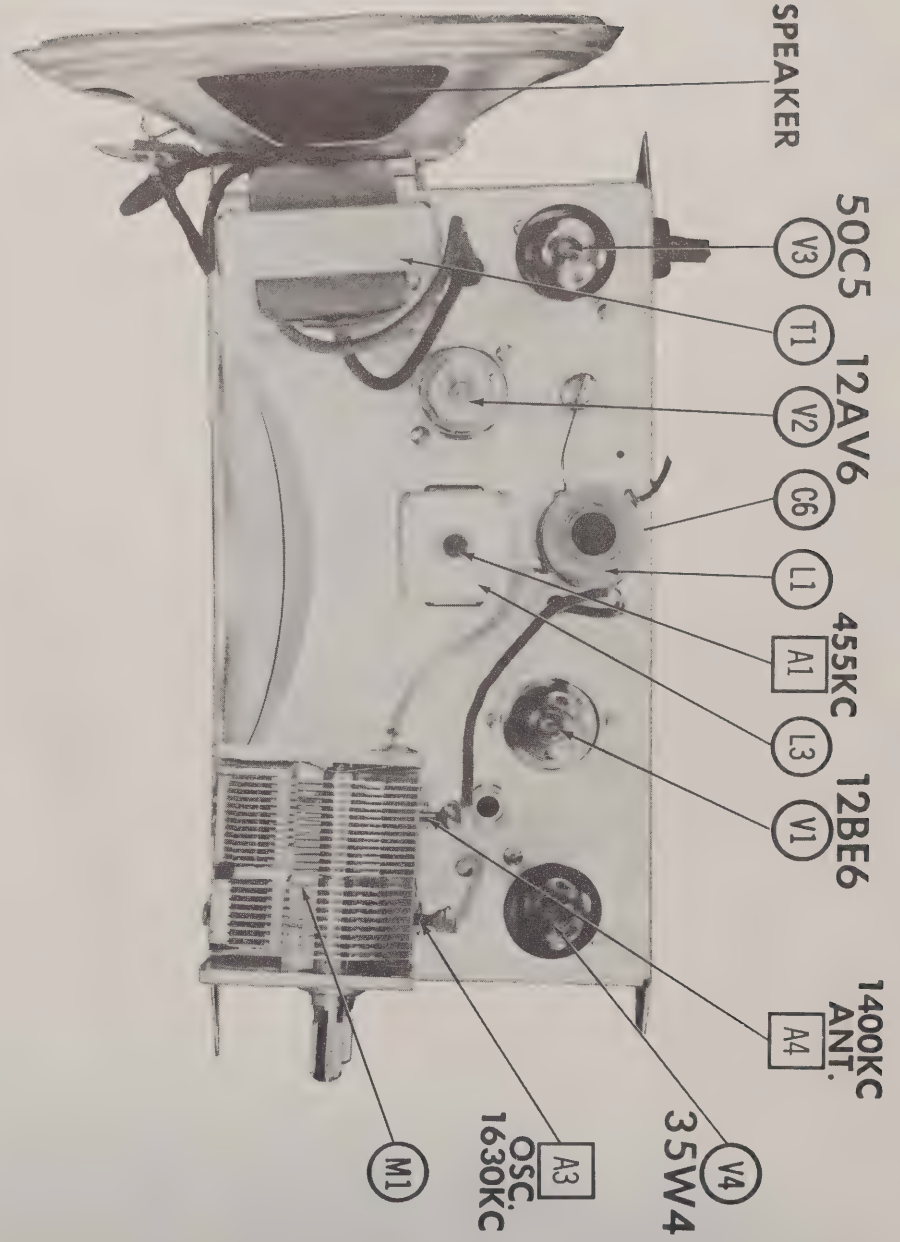
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R5	1800Ω	1	60-18211	BTA-1800	
R6	47Ω	1	60-47011	BTA-47	

Note 1: 120Ω used in some versions. (Part #60-12102)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1850Ω	3-4Ω	80-370	Z1101 ②	A-3025②	A-3332②	26S58 ①	S-12X②	① Use original mtg. frame. ② Bend mtg. feet down.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	79-463 ①	4A07	① Includes T1.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	10-76-1			70-A	160 Microhenries
L2	Osc. Coil	10-17-4				290 Microhenries
L3	IF Trans.	10-36-2				

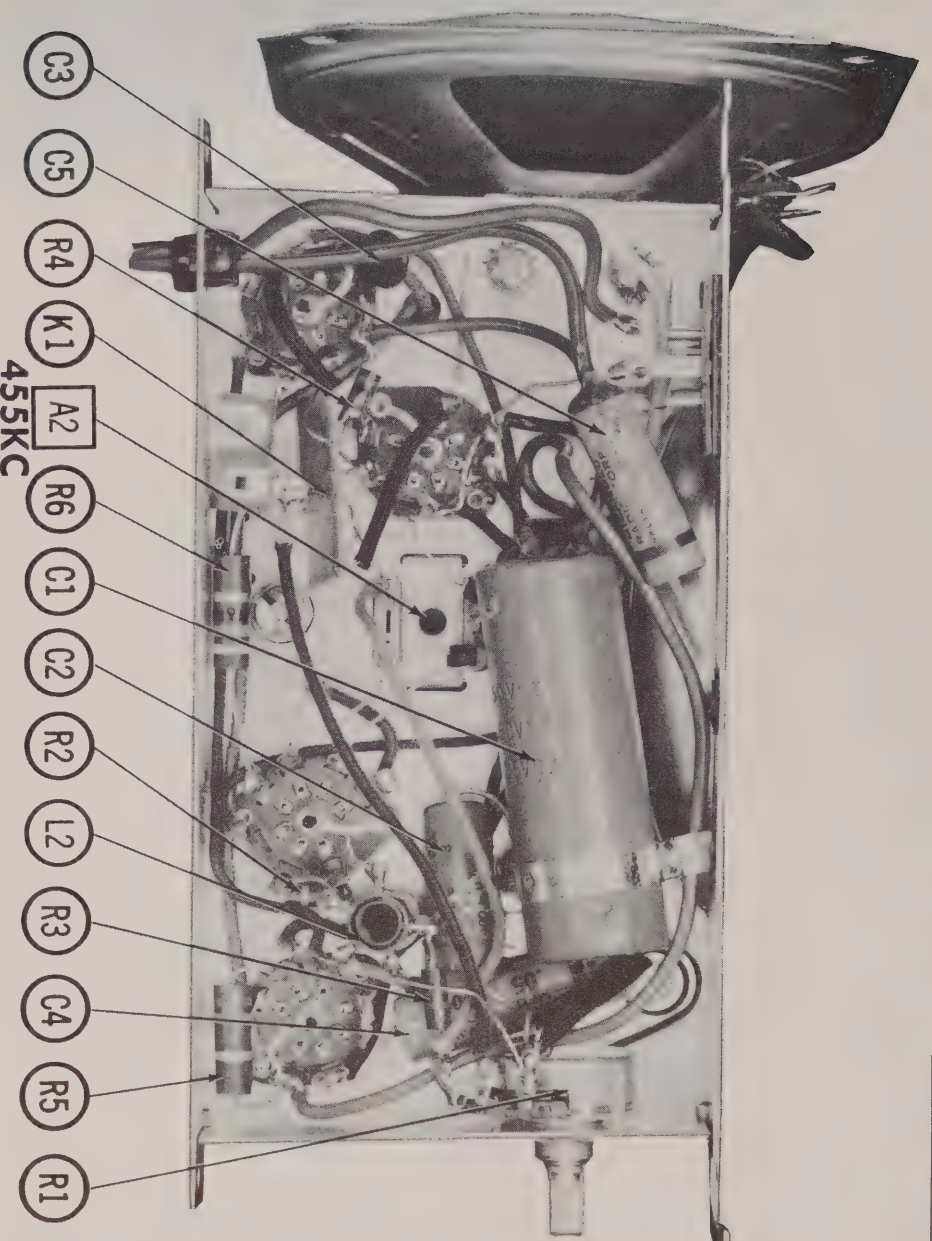
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K1	Det. -Audio Net.	5000MMF, 220MMF, 250MMF, 5000MMF, 10Meg, 470K, 470K	13-10-3	Aerovox Centralab Sprague	PA-306 PC-159 DT-6

MISCELLANEOUS

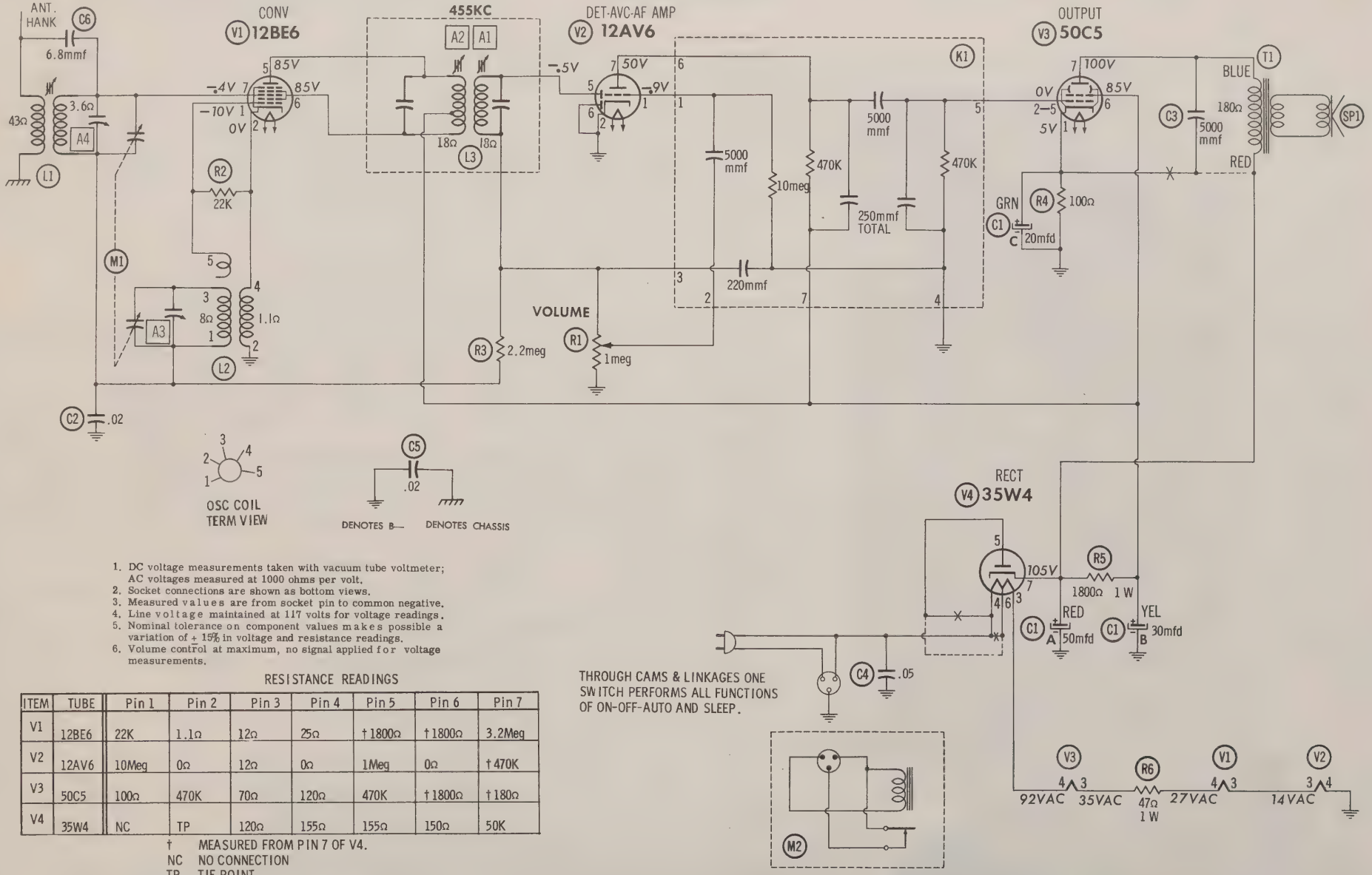
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	19-252	2 Gang (15-345MMF, 16-117MMF) Alternate part #19-43-2.
M2	Clock	84-2513	
	Knob	52-650	Clock
	Knob	52-651	Tuning
	Knob	52-649	Volume
	Cabinet	42-821	

CHASSIS—BOTTOM VIEW



SILVERTONE
MODEL 7018 (Ch. 528, 46500)

SILVERTONE
MODEL 7018 (Ch. 528, 46500)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.1Ω	12Ω	25Ω	†1800Ω	†1800Ω	3.2Meg
V2	12AV6	10Meg	0Ω	12Ω	0Ω	1Meg	0Ω	†470K
V3	50C5	100Ω	470K	70Ω	120Ω	470K	†1800Ω	†180Ω
V4	35W4	NC	TP	120Ω	155Ω	155Ω	150Ω	50K

† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SONORA MODEL 571

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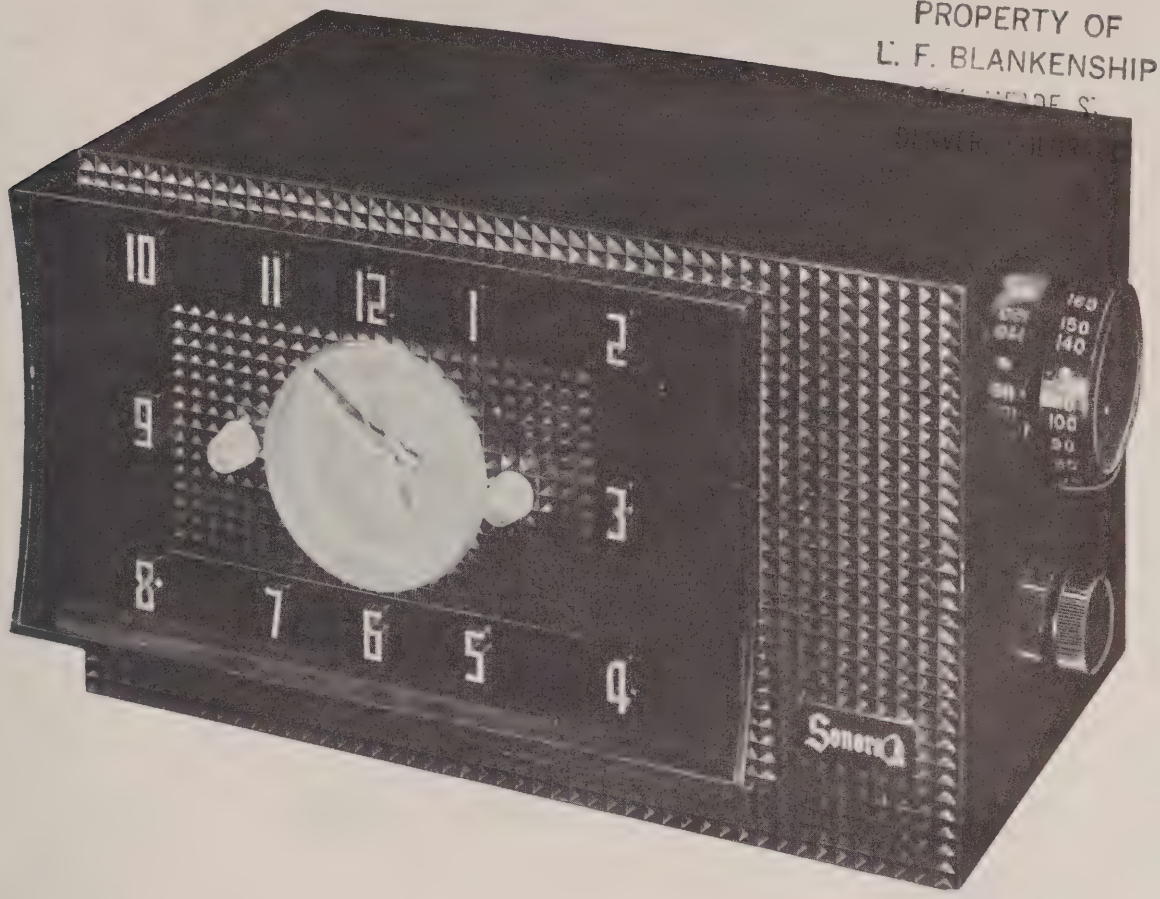
SONORA
MODEL 571



SONORA
MODEL 571

TRADE NAME	Sonora Model 571
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Avenue, Chicago, Illinois
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .3 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001 MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	"

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G801

PARTS LIST AND DESCRIPTIONS

SONORA MODEL 571

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amplifier	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	R-1781	PRS150V3050	BBRD5315	TCD497	TDLD-8	FMD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C4	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C5	10000		N-9062	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C6	10000		N-9062	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	R-1847	AB-744 *	A47-1Meg-Z*	Q13-137*	U53 *	Volume, 47K Stop
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

* Connect 47K Resistor In Series With Right Hand Terminal Viewed From Front Of Control, Terminals Down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

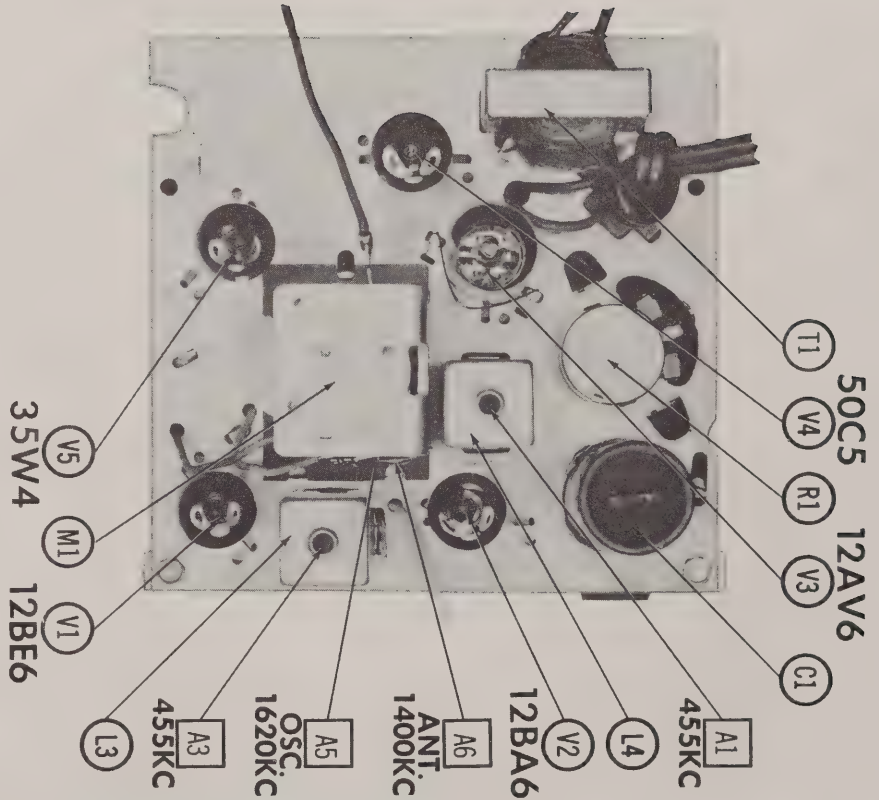
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	22K		N-4025	BTS-22K	
R3	100Ω		N-1615	BTS-100	
R4	1Meg		N-1262	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R5	180Ω		N-4067	BTS-180	
R6	1200Ω	1	N-4900	BTA-1200	
R7	22Ω		N-4633	BTS-22	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	R-1841	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Bend Mounting Feet Down

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	R-1478	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loop	R-2018				Includes cabinet back
L2	Osc. Coil	R-1777				197 Microhenries
L3	Input IF	R-1234				Alternate Part No. R-1237
L4	Output IF	R-1234				Alternate Part No. R-1237

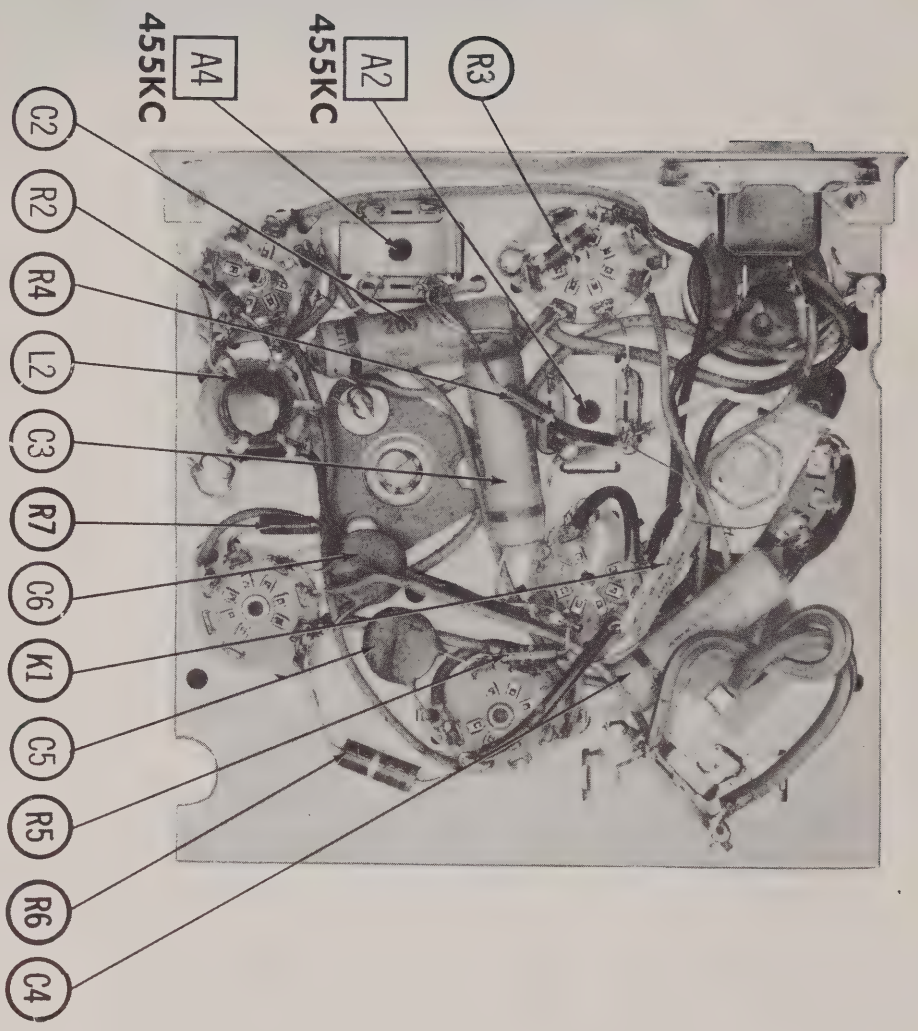
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA
K1	Det. -Audio Net	2000MMF, 5000MMF, 220MMF, 250MMF, 6.8Meg, 470K, 470K	R-1487	Aerovox PA113-1 Centralab PC-150 Cornell-Dubilier 116TM1 Erie 1408-01 Sprague DT-5

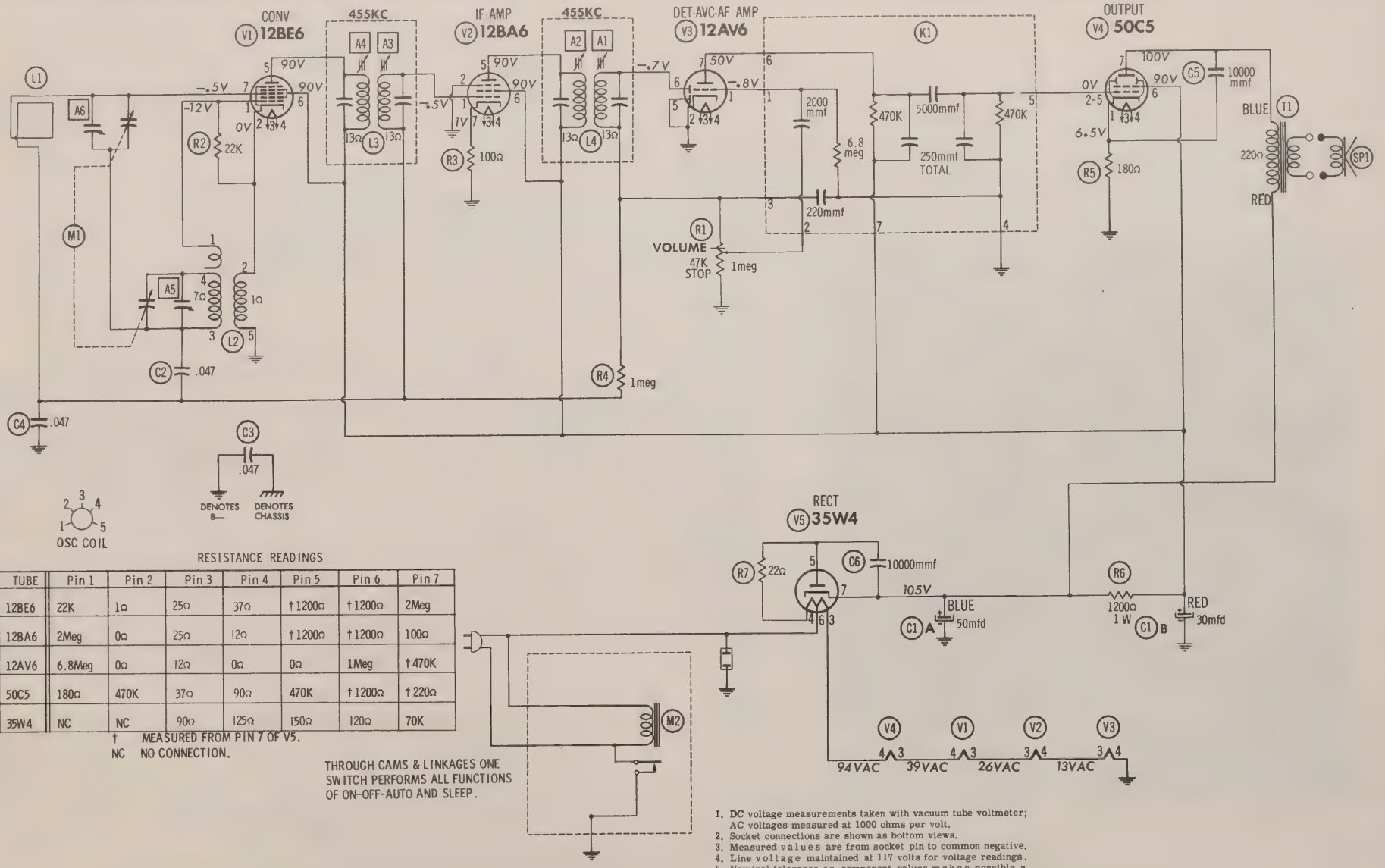
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M1	Tuning Cap	R-1779	2 Gang (15-250MMF, 27-125MMF)
M2	Clock	R-1845	

CHASSIS—BOTTOM VIEW



SONORA MODEL 571



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1Ω	25Ω	37Ω	†1200Ω	†1200Ω	2Meg
V2	12BA6	2Meg	0Ω	25Ω	12Ω	†1200Ω	†1200Ω	100Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	0Ω	1Meg	†470K
V4	50C5	180Ω	470K	37Ω	90Ω	470K	†1200Ω	†220Ω
V5	35W4	NC	NC	90Ω	125Ω	150Ω	120Ω	70K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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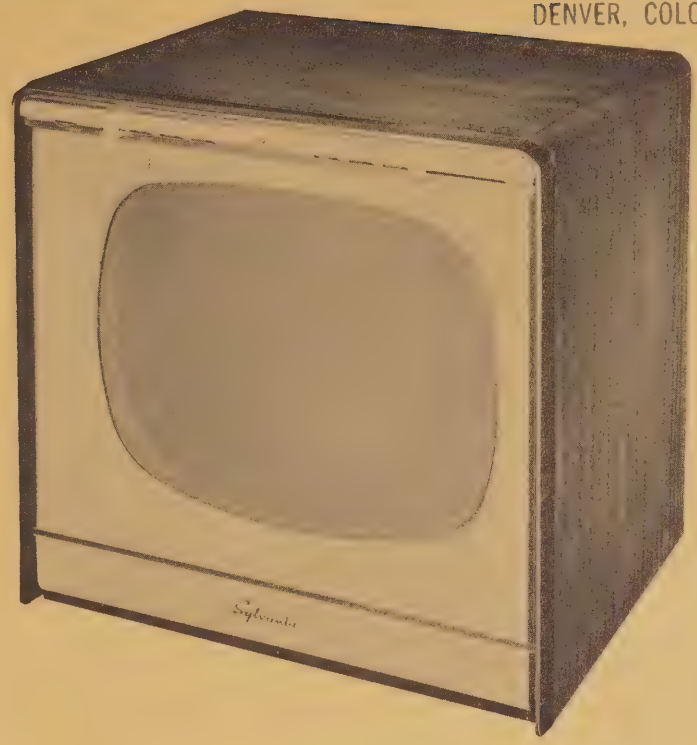

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C605 Series, 21C607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series, 24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)

SYLVANIA MODEL 21T303 (Ch. 1-533-7)

TRADE NAME	Sylvania	MODELS	CHASSIS
		21C501 Series, 21C502 Series, 21T201 Series, 21T206 Series, 21T301 Series, 24T301 Series	1-533-3, -4
		21C605 Series, 21C607 Series, 21T303 Series, 24C603 Series	1-533-7, -8, -9
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Division, 700 Ellicott St., Batavia, N. Y.		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING 210 Watts, 1.98 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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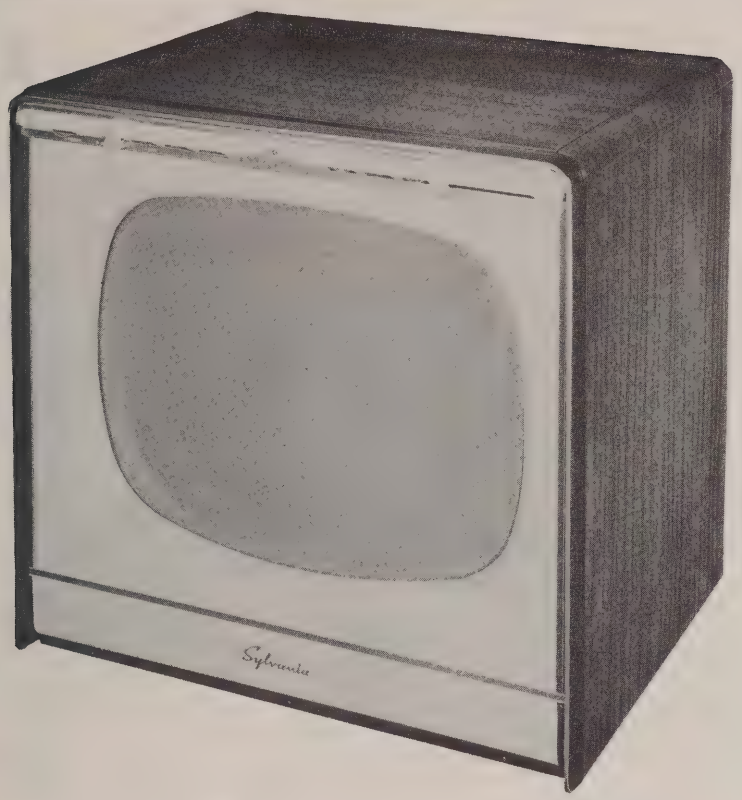

MODEL	CHASSIS
21T303	1-533-7

NOTE: Early production versions of chassis 1-533-3, -4, incorporated HV shorting switch. When servicing these chassis a metal tab is provided to hold switch open while servicing.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 wood screws. Remove rear cover.
2. Remove 1 wood screw. Remove antenna terminal board.
3. Remove 2 speaker leads, halolight plug, yoke plug, HV lead and picture tube socket.
4. Remove 2 chassis bolts.
5. Remove "On-Off" and "Channel Selector" knobs by removing the screw located under back knob.
6. Remove 2 screws holding metal trim. Pull assembly down and lift out.
7. Remove 5 push-on type control knobs by pulling down and out.
8. Remove 2 screws holding control panel to light shield.
9. Slide chassis partially out of cabinet.
10. Remove 1 wood screw holding control panel to top rear of cabinet. Remove panel.
11. Remove chassis.
12. Remove safety glass as outlined in "Picture Tube & Safety Glass Cleaning".
13. Remove 3 wood screws holding metal trim at bottom front of cabinet. Remove trim, remove nameplate.
14. Remove 4 bolts holding speaker. Remove speaker.

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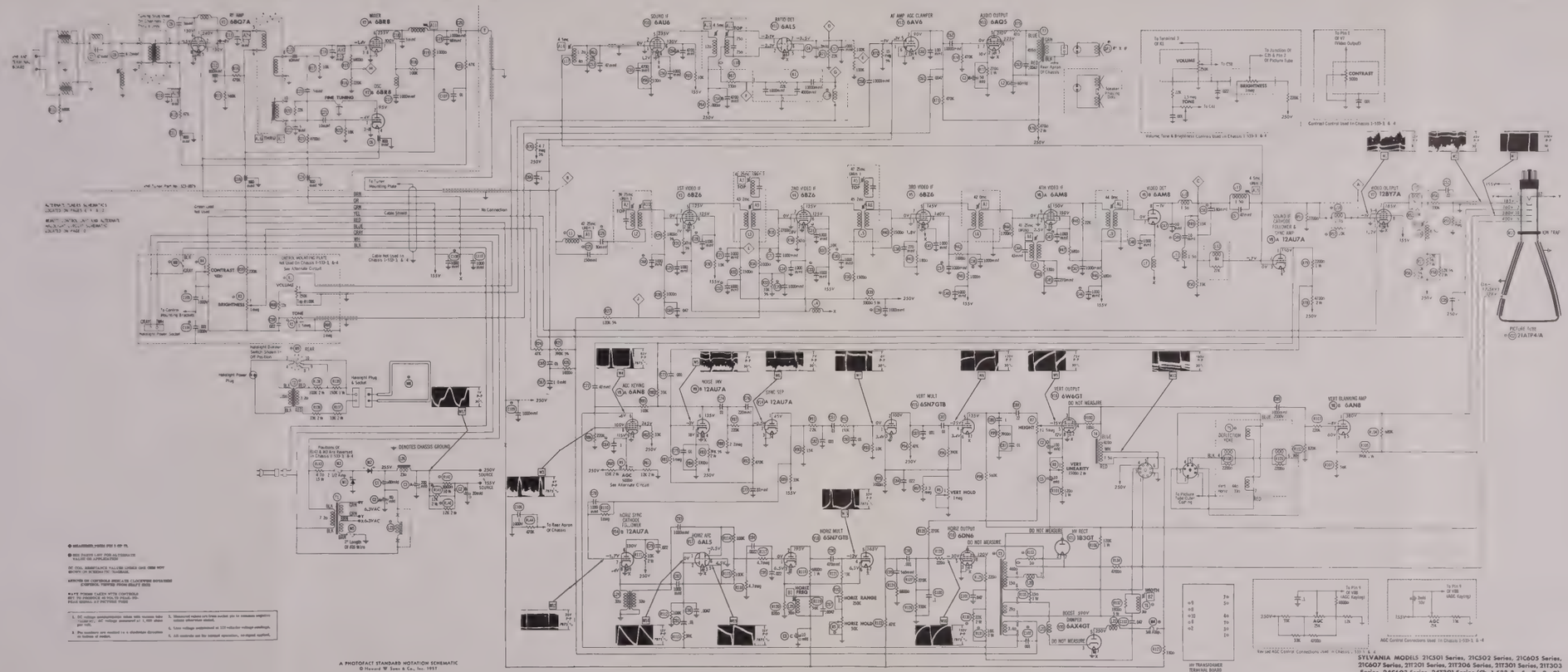

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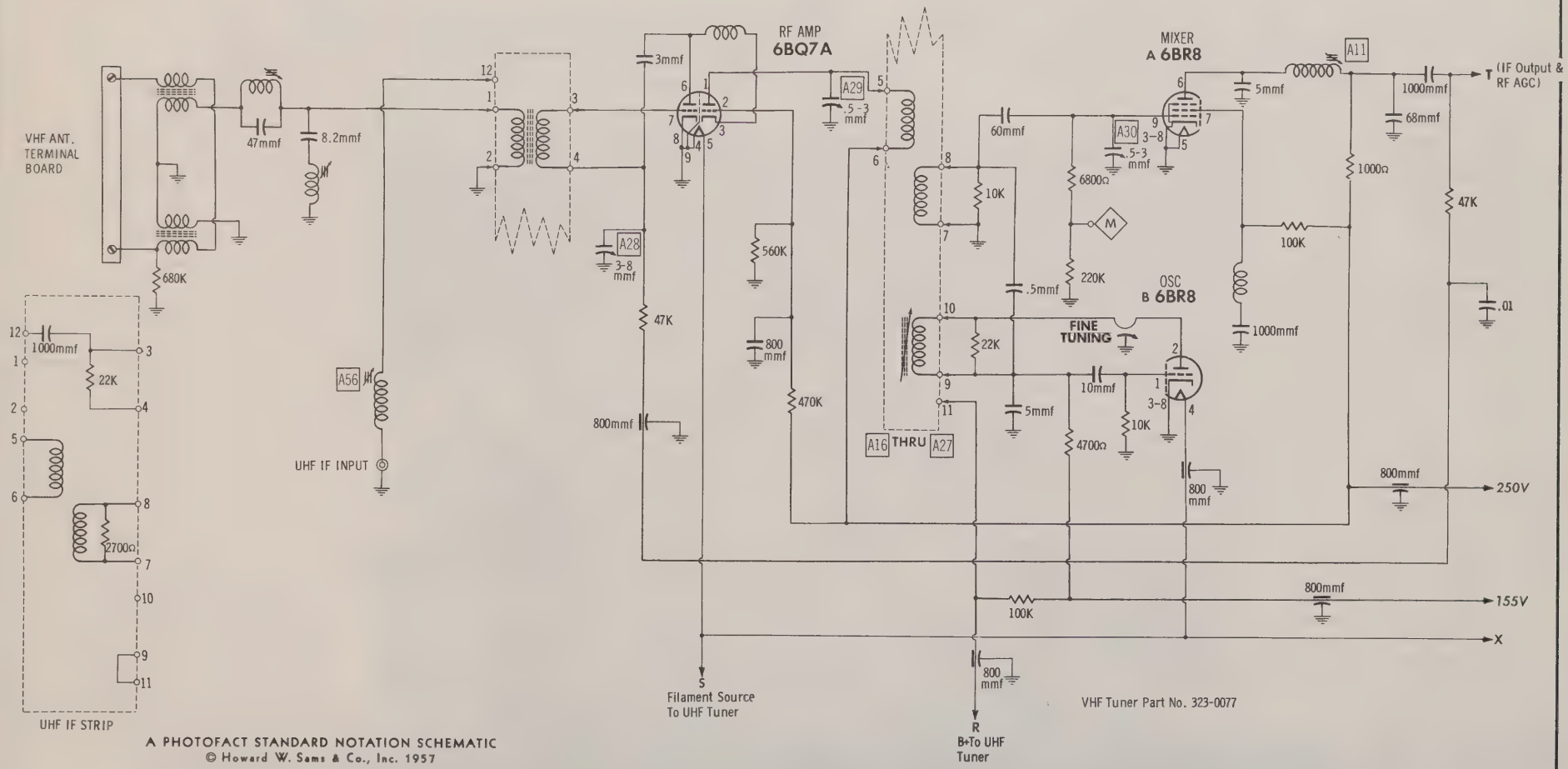
CHASSIS TOP VIEW

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C605 Series, 21C607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series, 24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)



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ALTERNATE VHF TUNER SCHEMATIC

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TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

1. Remove "On-Off" and "Channel Selector" knobs by removing screw located under each knob.

2. Remove 2 screws holding metal trim.

3. Using extreme caution, pull down on trim and lift out.

4. Remove 2 metal screws holding metal clips. Remove safety glass and halolight mask.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. AGC Adjustments

The AGC should be readjusted according to the following instructions whenever the receiver is connected to a different antenna.

1. Connect the antenna to the receiver.

2. Remove the video output 12BY7A (V7) from its socket. Insert in its place a 9 pin test adaptor socket and reinsert the 12BY7A in the test adaptor socket. (If an adaptor socket is not available, hook a piece of wire around pin 2 of the 12BY7A making sure that the wire does not touch the chassis or other pins of the tube and reinsert the tube in its socket.)

3. Connect the vertical amplifier of the oscilloscope or peak to peak voltmeter to pin 2 of the 12BY7A (V7) and the low side to chassis. Calibrate the scope to indicate 4 volts peak to peak using a 17.6 volts peak to peak signal (6 volt filament string) or an external calibrator.

4. Set the receiver to the strongest channel available in the area. Adjust the fine tuning for the best picture. Set the contrast and brightness controls fully counter clockwise.

5. Adjust the AGC control (R9) to obtain 4 volts (early production chassis 1-533-3, -4 require 4.25 volts) peak to peak on oscilloscope or peak to peak voltmeter.

B. Alternate AGC Adjustments

1. Connect the antenna to the receiver

2. Tune in a strong signal.

3. Adjust the contrast control fully counter clockwise and the brightness control fully clockwise.

4. Adjust the vertical hold control so that the picture rolls downward very slowly or if possible, stop with the blanking bar across the center of the screen.

5. While observing the vertical blanking bar, adjust the AGC control (R9) clockwise until the sync pulses start to become lighter or the blanking bar becomes as black as the sync pulse. Then turn the control counter clockwise to the point where sync pulse becomes prominent on the blanking bar.

C. Focus

Adjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis. Set the horizontal hold control at mid-range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A12) located on top of chassis.

FUSES

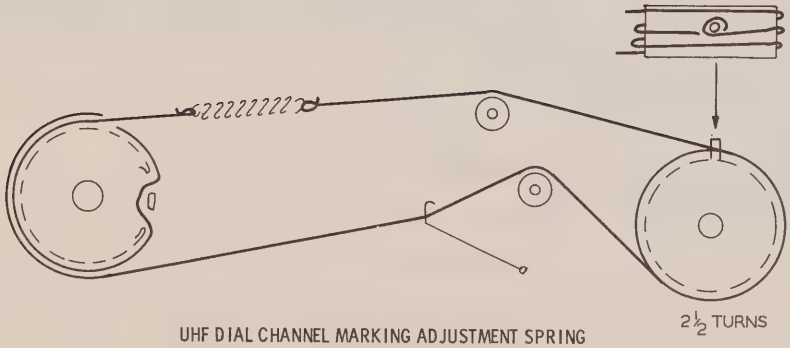
Three fuses are used. One for horiz. sweep circuit protection and two for LV power supply protection. See tube placement chart for location.

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of picture tube. Turn the knurled (disk like) knob and at the same time rotate the ring around the tube until picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible, and position the two magnets so that the sides are straight.



UHF DIAL CHANNEL MARKING ADJUSTMENT SPRING

UHF DRIVE CORD STRINGING

SET 352 FOLDER 16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Remove the horizontal output tube 6DN6 (V9) to disable the high voltage.
All connections to chassis are to be made to the insulated center deck.
Connect a short across the antenna terminals except when signal is to be connected across the antenna terminals.
In cases where there are two coils in the same can, the cores must be adjusted to insure the greatest separation between them.
Allow a 15 minute warm-up period for receiver and test equipment. Use non-metallic alignment tools.

VHF IF ALIGNMENT

Connect the negative lead of a 4 volt bias battery to point Ⓒ. Positive to chassis.
If a separate marker generator is used for the scope alignment, loosely couple it to sweep generator lead near the connection to the receiver. Keep all leads from the generator and the scope as short as possible and shielded.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	4700MMF	High side to point Ⓐ. Low side to chassis.	Not used.	47.25MC	Any non-interfering high band channel.	Use VTVM. DC probe to point Ⓑ. Common to chassis.	A1	Use maximum generator output. Adjust for MINIMUM deflection on VTVM.
2.	"	"	"	39.75MC	"	"	A2	"
3.	"	"	"	41.25MC	"	"	A3, A4	"
4.	"	"	"	47.25MC	"	"	A5	"
5.	"	"	"	44.0MC	"	"	A6	Keep generator output adjusted to -1 to -3 reading on VTVM. Adjust slug for maximum deflection on VTVM.
6.	"	"	"	42.0MC	"	"	A7	"
7.	"	"	"	45.2MC	"	"	A8	"
8.	"	"	"	43.2MC	"	"	A9	"
9.	"	High side to pin 1 (grid) of 6BZ6 (V3). Low side to chassis.	43MC (10MC Swp)	41.25MC 42.1MC 45.75MC 47.25MC	"	High side thru 33K to point Ⓐ. Low side to chassis.		Calibrate scope to produce 3 to 4 inches of vertical sweep with 3 volts input. Adjust sweep generator output to produce 3 volts peak to peak on scope. Check for response similar to Fig. 1. If necessary, make following adjustments. Retouch A5 to place 45.75MC marker at 50% on curve. Adjust A8 to correct tilt. Retouch A7 to place 42.1MC marker at 70%. Adjust A9 to correct tilt. Retouch A8 and A9 simultaneously to restore bump of tilt in curve. Repeat if necessary. Retouch A3 and A4 to place 41.25MC marker in trap notch. Retouch A5 to place 47.25MC marker in trap notch.
10.	Direct	High side to point Ⓐ on turret type tuners. High side to ungrounded tube shield (analog over-center tube on switch type tuners. Low side to chassis.	43MC (10MC Swp)	39.75MC 41.25MC 42.1MC 45.75MC 47.25MC	"	"	A1, A2 A10, A11	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2 to place 39.75MC marker as in Fig. 2. Adjust A10 and A11 simultaneously to place the 45.75MC marker at 50% on curve. If 42.1MC marker is not at 70% position, readjust A10 and A11 to give best compromise of proper marker location and MINIMUM tilt. (All has two slug positions where proper shaped curve can be obtained). Use the one farthest counter clockwise. Remove test equipment and bias.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM.

Connect a clip lead from pin 1 (grid) of the 6BZ6 (V3) to chassis. If a crystal calibrated signal generator is not available for sound alignment, a good strong TV signal may be used.
Connect two matched 100K (1a%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓐ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Direct	High side to point Ⓐ. Low side to chassis.	4.5MC (tuned)	Any	DC probe to pin 5 of 6AL5 (V11). Common to point Ⓒ.	A12, A13, A14	Adjust for maximum deflection on VTVM.
12.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓐ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Connect a clip lead from pin 1 (grid) of 6BZ6 (V4) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Direct	High side to pin 7 of 6AM8 (V5). Low side to chassis.	4.5MC (tuned)	Any	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A15	Adjust for MINIMUM deflection. Remove short from V4.

ALTERNATE 4.5MC TRAP ALIGNMENT

Turn the set on and tune in a TV station. Misadjust the fine tuning until sound bars can be seen in the picture. A fine-grain like pattern will be noted in the picture.
Adjust A15 until the grain-like pattern is either eliminated or is at a MINIMUM. Readjust the fine tuning for normal picture.

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75
3	60-66	61.25	65.75
4	66-72	67.25	71.75
5	76-82	77.25	81.75
6	82-88	83.25	87.75
7	174-180	175.25	179.75
8	180-186	181.25	185.75
9	186-192	187.25	191.75
10	192-198	193.25	197.75
11	198-204	199.25	203.75
12	204-210	205.25	209.75
13	210-216	211.25	215.75
14	470-476	471.25	475.75
15	476-482	477.25	481.75
16	482-488	483.25	487.75
17	488-494	489.25	493.75
18	494-500	495.25	499.75
19	500-506	501.25	505.75
20	506-512	507.25	511.75
21	512-518	513.25	517.75
22	518-524	519.25	523.75
23	524-530	525.25	529.75
24	530-536	531.25	535.75
25	536-542	537.25	541.75
26	542-548	543.25	547.75
27	548-554	549.25	553.75
28	554-560	555.25	559.75
29	560-566	561.25	565.75
30	566-572	567.25	571.75
31	572-578	573.25	577.75
32	578-584	579.25	583.75
33	584-590	585.25	589.75
34	590-596	591.25	595.75
35	596-602	597.25	601.75
36	602-608	603.25	607.75
37	608-614	609.25	613.75
38	614-620	615.25	619.75
39	620-626	621.25	625.75
40	626-632	627.25	631.75
41	632-638	633.25	637.75
42	638-644	639.25	643.75
43	644-650	645.25	649.75
44	650-656	651.25	655.75
45	656-662	657.25	661.75
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47	668-674	669.25	673.75
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52	698-704	699.25	703.75
53	704-710	705.25	709.75
54	710-716	711.25	715.75
55	716-722	717.25	721.75
56	722-728	723.25	727.75
57	728-734	729.25	733.75
58	734-740	735.25	739.75
59	740-746	741.25	745.75
60	746-752	747.25	751.75
61	752-758	753.25	757.75
62	758-764	759.25	763.75
63	764-770	765.25	769.75
64	770-776	771.25	775.75
65	776-782	777.25	781.75
66	782-788	783.25	787.75
67	788-794	789.25	793.75
68	794-800	795.25	799.75
69	800-806	801.25	805.75
70	806-812	807.25	811.75
71	812-818	813.25	817.75
72	818-824	819.25	823.75
73	824-830	825.25	829.75
74	830-836	831.25	835.75
75	836-842	837.25	841.75
76	842-848	843.25	847.75
77	848-854	849.25	853.75
78	854-860	855.25	859.75
79	860-866	861.25	865.75
80	866-872	867.25	871.75
81	872-878	873.25	877.75
82	878-884	879.25	883.75
83	884-890	885.25	889.75

FIG. 1

FIG. 2

FIG. 3

FIG. 4

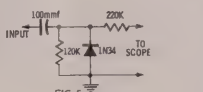


FIG. 5

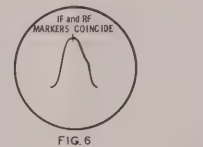


FIG. 6

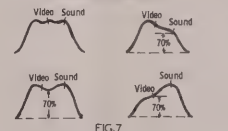


FIG. 7

FIG. 8

VHF RF AND MIXER ALIGNMENT FOR TUNERS #325-0069 AND #323-0078

Connect the bias as under "VHF Oscillator Alignment For Tuners #323-0069 & 323-0078".
Remove the IF input cable from the VHF tuner socket. Remove VHF tuner cover to gain access to the internal coils and adjustments.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
25.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru .03MFD to point Ⓑ. Low side to chassis.	A36, A37 A38	Adjust A36 to position markers as in Fig. 7. Adjust A37 for flat topped response. Adjust A38 for maximum amplitude.
26.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A39, A40	Adjust for symmetrical response as in Fig. 7.
27.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check each channel for response similar to Fig. 7. If not within limits, repeat steps 25 and 26. If necessary, make compromise adjustments of A36 thru A40 for best acceptable response.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
28.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A41, A42 A43	Adjust A41 to position markers as in Fig. 7. Adjust A42 for flat topped response. Adjust A43 for maximum amplitude.
29.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A44, A45 A46	Compress or expand coil turns for curve similar to Fig. 7.
30.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A47, A48 A49	"
31.	"	"	65MC (10MC Swp)	61.25MC 65.75MC	3	"	A50, A51 A52	"
32.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A53, A54 A55	"
33.	Recheck all channels for flat-topped response. If necessary, retouch A36 thru A55 in order given. A dip of 30% is permissable on all channels.							

UHF IF ALIGNMENT

Remove the UHF IF output cable from the UHF IF input socket on the VHF tuner.
Remove the IF input cable from the VHF tuner socket.
Connect bias as under "VHF Oscillator Alignment for Tuners #323-0069 & #323-0078".

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
34.	300Ω carbon resistor	High side to UHF IF input socket. Low side to chassis.	43.0MC (10MC Swp)	45.75MC 45.75MC	UHF	Vert. amp. thru .03MFD to point Ⓐ or Ⓑ. Low side to chassis.	A56, A57, A58	Adjust A58 for maximum amplitude similar to Fig. 5. Adjust A57 and A56 (in switch type tuner) to position markers and remove tilt from curve. Remove test equipment and 300Ω resistor from VHF tuner. Insert UHF IF output cable into UHF IF input socket on VHF tuner. Insert IF input cable into IF input socket on VHF tuner.

UHF TUNER ALIGNMENT

Remove access covers from front and right side of UHF tuner to gain access to A59, A61 & A62.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
35.	Two 120Ω carbon resistors	Across UHF antenna terminals with 120Ω in each lead.	Not used.	480MC (unmod)	UHF UHF tuned fully counter clockwise.	Use VTVM. DC probe to point Ⓑ. Common to Chassis.	A59	Adjust for maximum deflection on VTVM.
36.	"	"	"	809MC (unmod)	UHF tuned fully counter clockwise.	"	A60	Adjust for maximum deflection on VTVM. Repeat steps 35 and 36.
	Connect bias as under "UHF IF Alignment". Loosely couple marker generator to UHF IF output lead.							
37.	Two 120Ω carbon resistors	Across UHF antenna terminals with 120Ω in each lead.	809MC (10MC Swp)	42.1MC 45.75MC	UHF tuned fully clockwise.	Vert. amp. thru .03MFD to point Ⓐ. Low side to chassis.	A61, A62	Adjust by moving tabs toward or away from stator as necessary to obtain maximum amplitude with markers as shown in Fig. 8. Tune UHF sweep generator and UHF tuner across entire UHF band (See UHF frequency chart) and observe response curve. If at any point response curve shows excessive distortion, much lower amplitude, or displaced markers, stop the UHF tuner rotor at that point and center the response curve on the scope with the sweep generator tuning control. Adjust for correct response by squeezing or spreading rotor plates only at point where it is just meshing at stator. Continue checking rest of UHF band. Recheck entire band if adjustment was necessary. Remove bias and test equipment.

VIDEO PEAKING COIL ADJUSTMENT

The video peaking coil (A63) is adjusted at the factory for proper transient response of the video circuits. Ordinarily this coil will not need to be adjusted by the service technician. On any station where trailing whites or excessive smear is noted, a SLIGHT adjustment of A63 may improve the picture quality on that station; however, this adjustment may effect the quality of the picture on other channels.
If this peaking coil is replaced by the technician in servicing, it will need adjusting.
Before performing any adjustment on A63, make sure that the set is in perfect alignment. Then tune in a station and adjust A63 until there are no trailing whites or smear in the picture. Check all other available channels to make certain that picture quality has not been sacrificed.

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNERS #323-0076 AND #323-0077

Connect the bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 33K to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A17	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A18	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A19	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A20	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A21	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A22	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A23	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A24	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A25	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A26	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A27	

VHF RF AND MIXER ALIGNMENT FOR TUNERS #323-0076 AND #323-0077

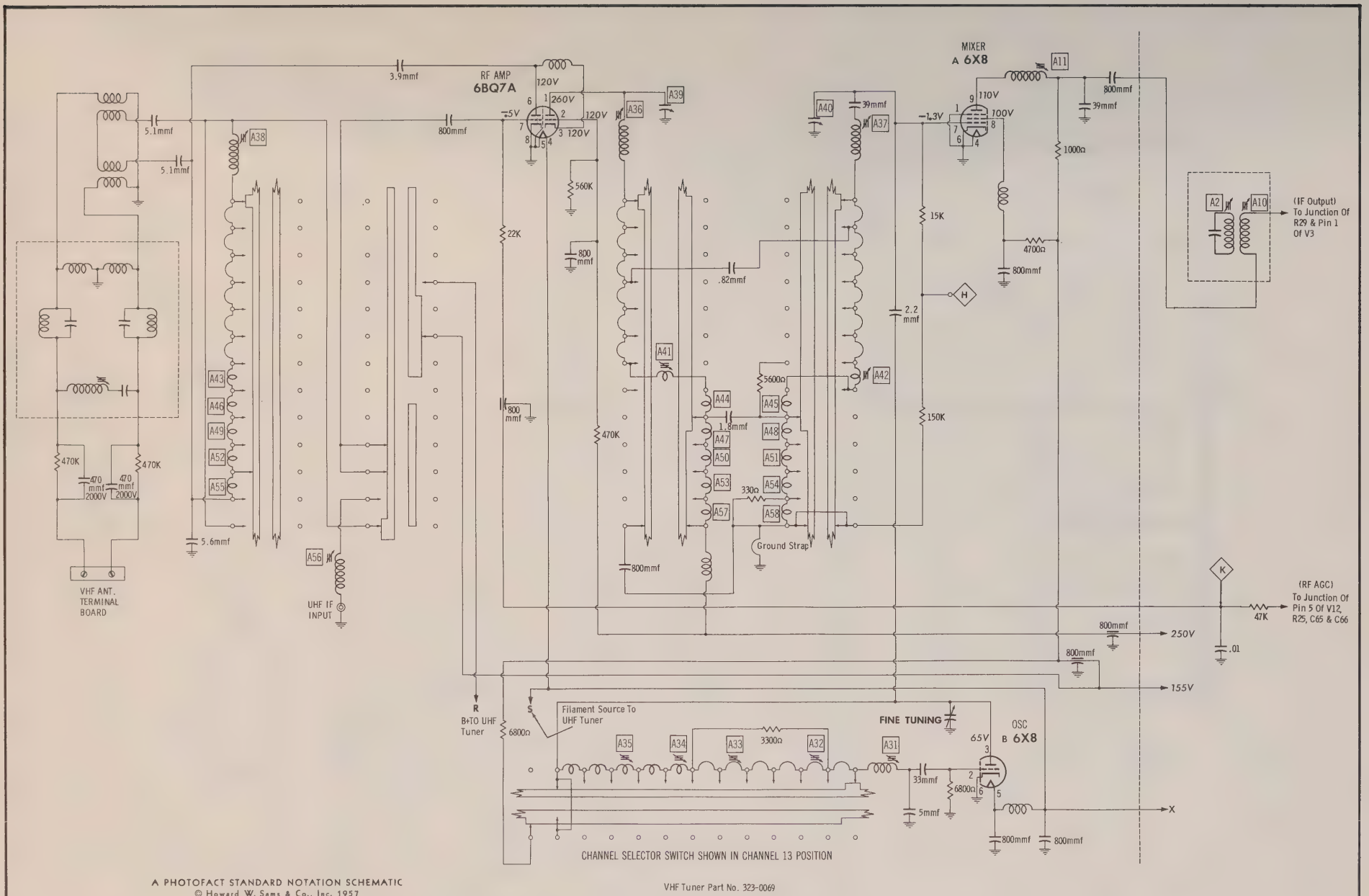
Connect the bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point (M). Low side to chassis.	A28, A29 A30	Adjust for response curve similar to Fig. 4 with markers above 90%.
16.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

VHF OSCILLATOR ALIGNMENT FOR TUNERS #323-0069 AND #323-0078

Keep leads between receiver and test equipment as short as possible and shielded.
Connect the negative lead of a 2. 5 volt bias battery to point (K). Positive to chassis.
A separate marker generator is used, loosely couple it to the generator leads at the antenna terminal connections.
Unsolder primary of L3 from pin 5 (plate) of 6BZ6 (V3) and connect a 330Ω resistor from pin 5 (plate) of V3 to point (L).
Remove 6BZ6 (V4) from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	45. 75MC 211. 25MC	13	Vert. amp. thru detector probe (Fig. 5) using short leads to pin 5 (plate) of 6BZ6 (V3). Low side to chassis.	A31	Adjust so that RF and IF markers coincide as in Fig. 6. Curves may not be symmetrical until RF alignment is complete.
18.	"	"	201MC (10MC Swp)	45. 75MC 199. 25MC	11	"	A32	"
19.	"	"	183MC (10MC Swp)	45. 75MC 181. 25MC	8	"	A33	"
20.	"	"	85MC (10MC Swp)	45. 75MC 83. 25MC	6	"	A34	"
21.	"	"	69MC (10MC Swp)	45. 75MC 67. 25MC	4	"	A35	"
22.	"	"	79MC (10MC Swp)	45. 75MC 77. 25MC	5	"		Check so that RF and IF markers can be coincided by rotation of fine tuning control. If not, adjust by expanding or compressing turns of channel 5 osc. coil.
23.	"	"	63MC (10MC Swp)	45. 75MC 61. 25MC	3	"		Check so that RF and IF markers can be coincided by rotation of fine tuning control. If not, adjust by expanding or compressing turns of channel 3 osc. coil.
24.	"	"	57MC (10MC Swp)	45. 75MC 55. 25MC	2	"		Check so that RF and IF markers can be coincided by rotation of fine tuning control. If not, adjust by expanding or compressing turns of channel 2 osc. coil. Restore circuit to normal.



VHF Tuner Part No. 323-0069

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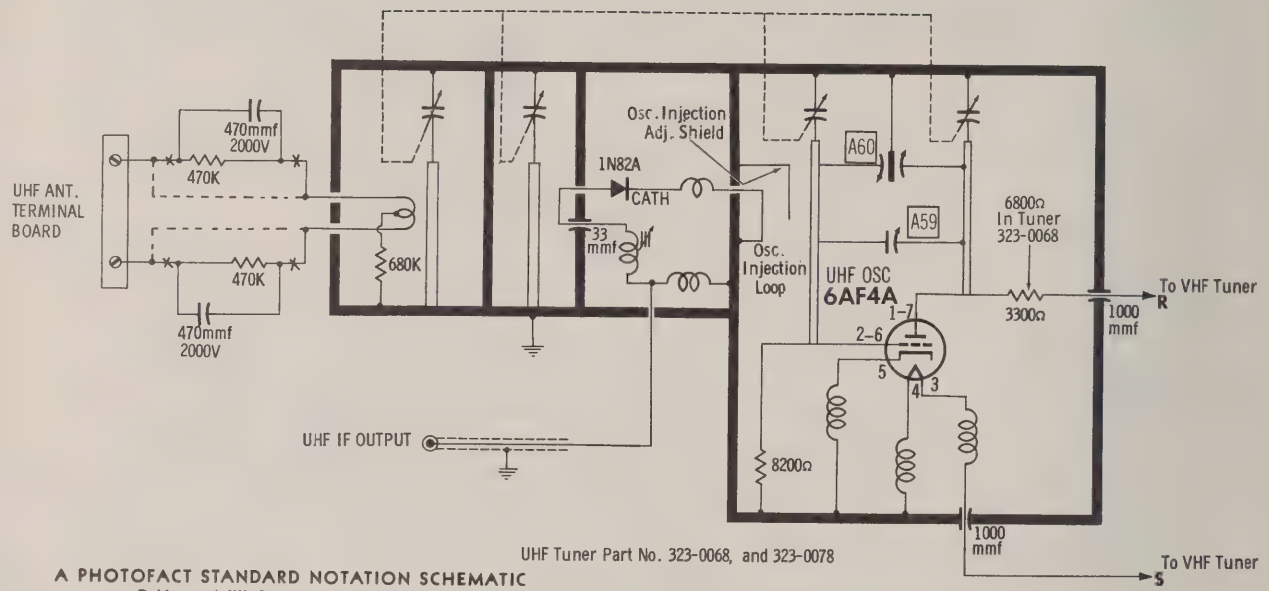
ALTERNATE VHF TUNER SCHEMATIC

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C603 Series, 21C607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series, 24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)



UHF Tuner Part No. 323-0068, and 323-0078

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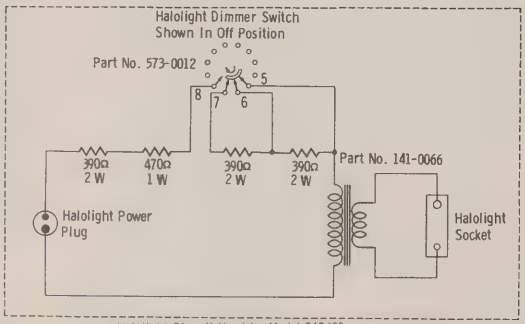
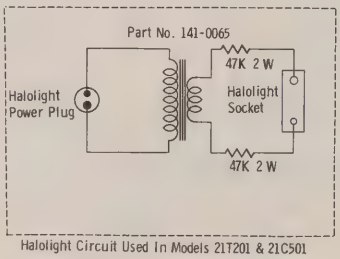
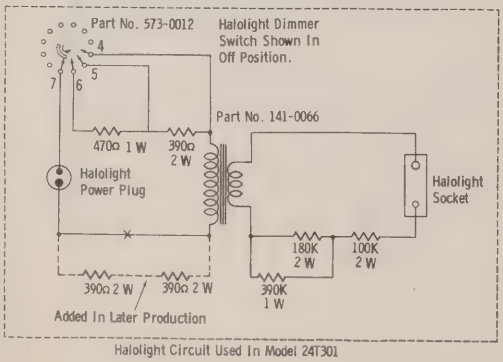
ALTERNATE UHF TUNER SCHEMATIC



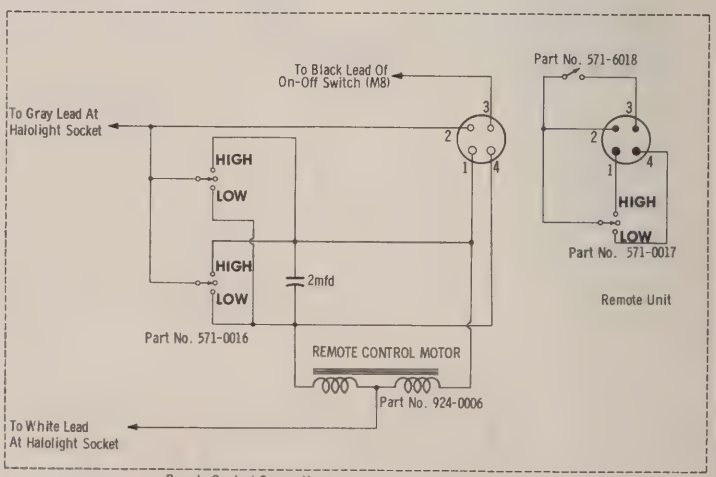
Halolight Circuit Used In Model 24C603



Halolight Circuit Used In Models 21T201 & 21C501



Halolight Circuit Used In Model 24T301



Remote Control Connections

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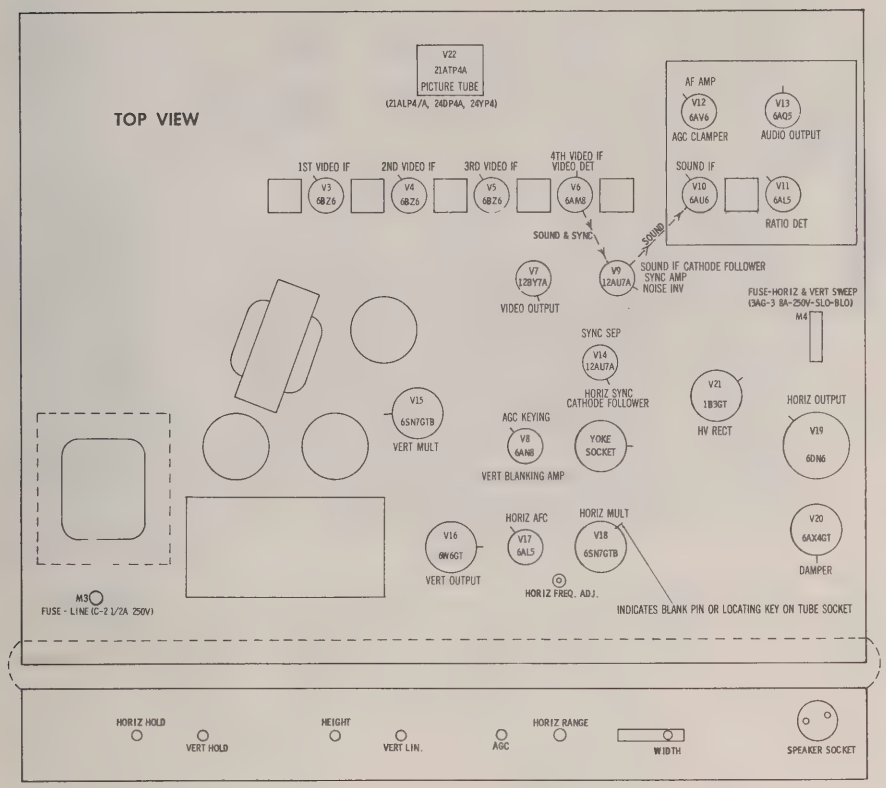
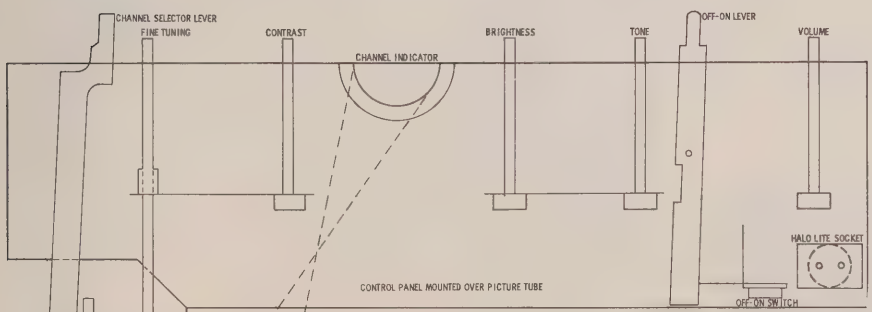
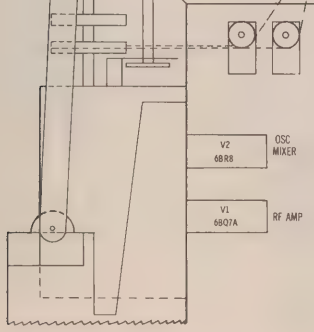
ALTERNATE HALOLIGHT & REMOTE CONTROL SCHEMATIC

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO







TUBE FAILURE CHECK CHART

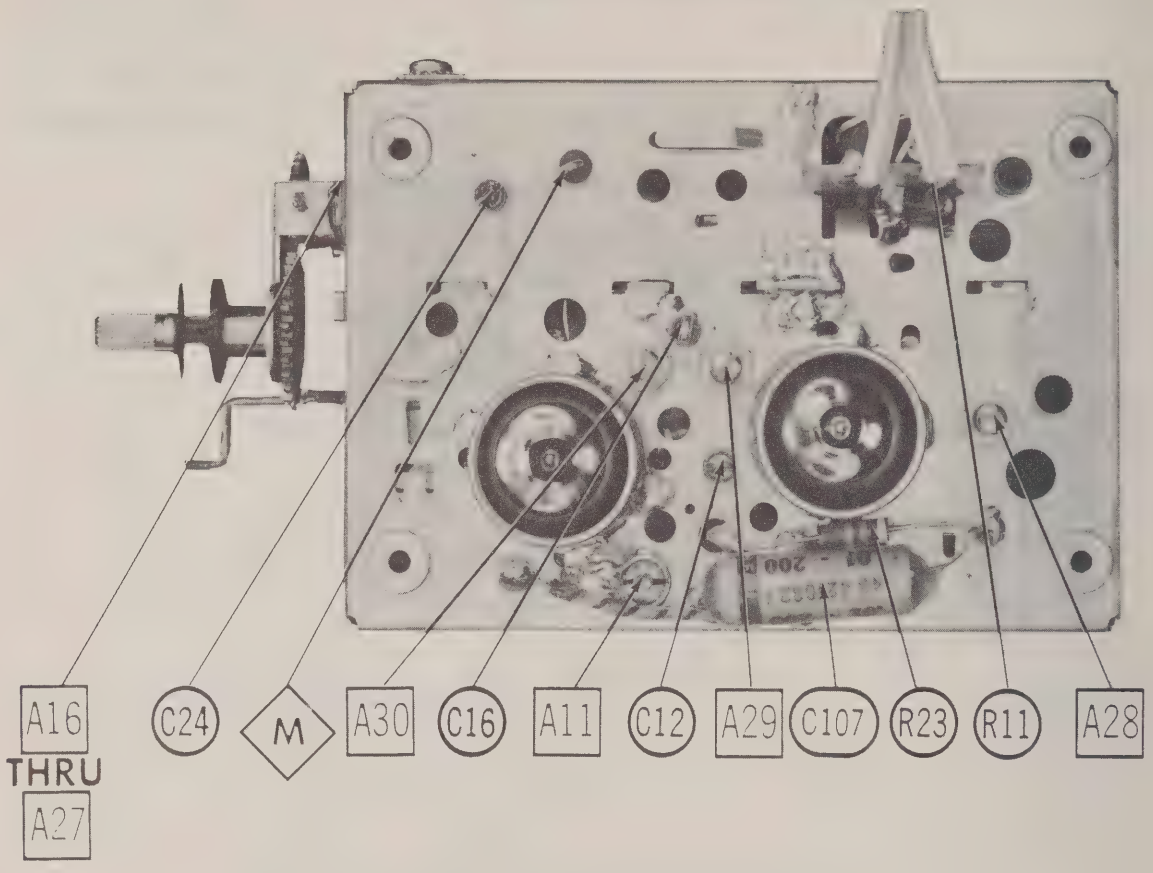
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuses (M3, M5), Rectifiers (M1, M2)**

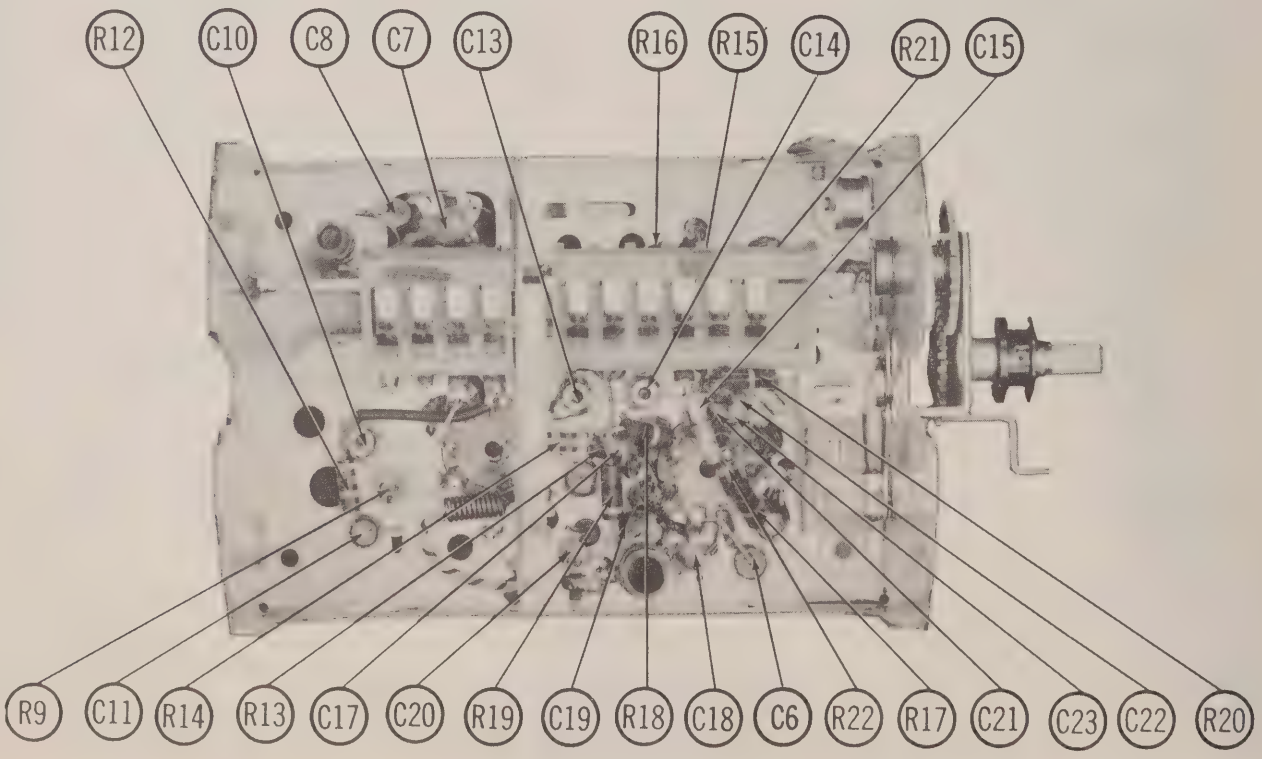
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V8**
No pic, no sound, has snow - **V1, V2, V3, V12**
No pic, has sound, has raster - **V7, V22**
Has pic, no sound - **V9, V10, V11, V12, V13**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V9, V14, V15**
No horiz. sync - **V9, V14, V17, V18**
No vert. or horiz. sync - **V9, V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21, V22, Fuse (M4)**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V18, V19, V20**
Narrow picture - **V18, V19, V20, M1, M2**
Vert. off freq. - **V9, V14, V15**
Horiz. off freq. - **V9, V14, V17, V18**



TUNER TOP VIEW

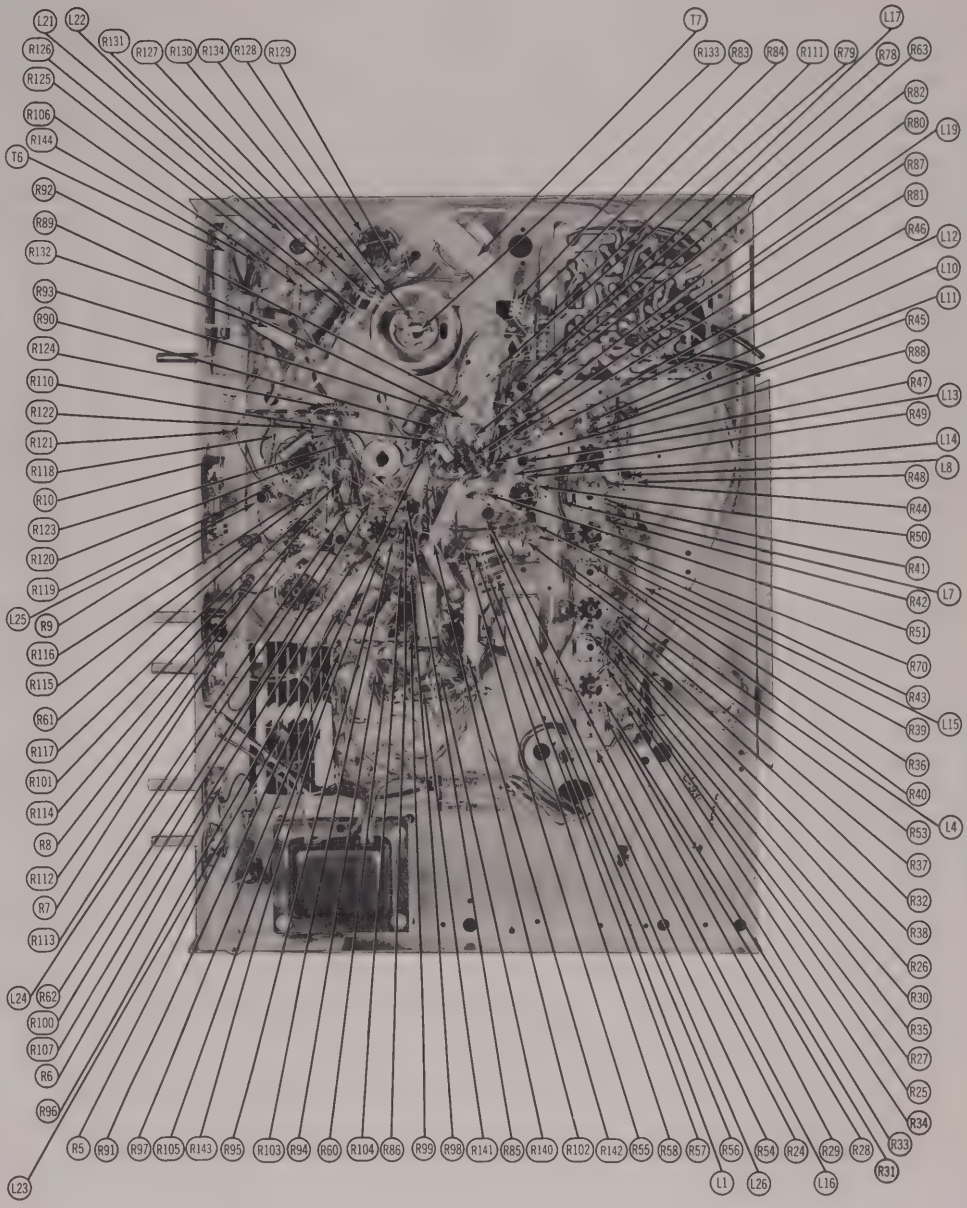


TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

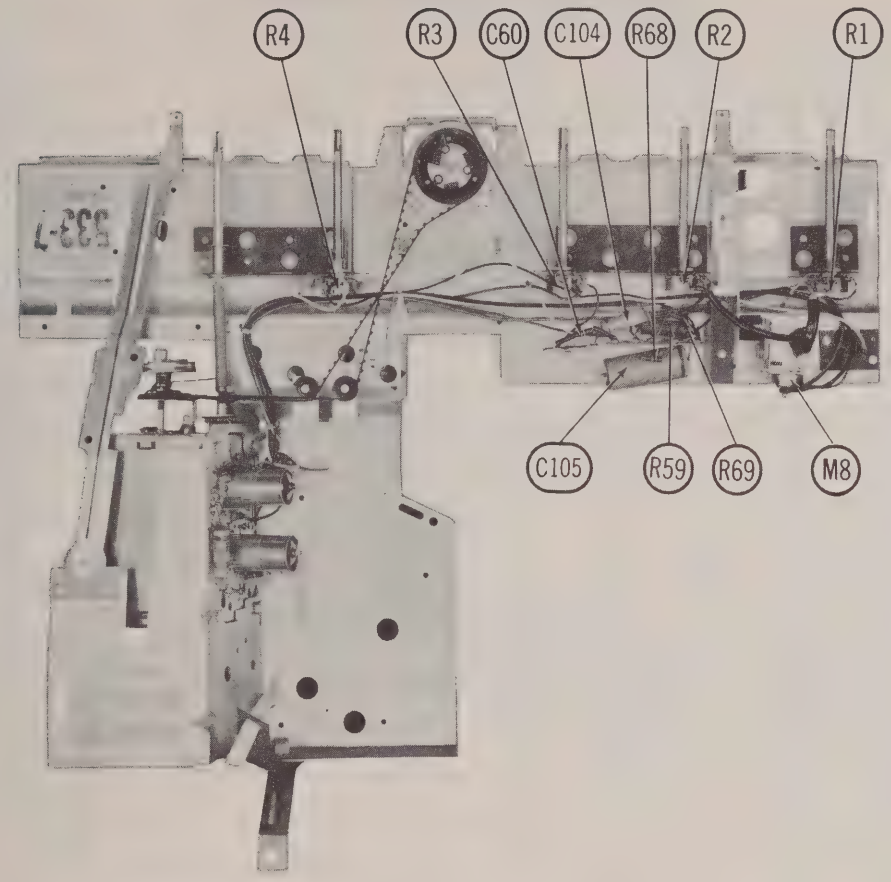
SYLVANIA MODELS 21CS01 Series, 21CS02 Series, 21CG03 Series, 21CG07 Series, 21T301 Series, 21T306 Series, 21T301 Series, 21T305 Series, 24CS03 Series, 24CT01 Series, CK-1-3, CK-3-4, -7, -8, -91

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

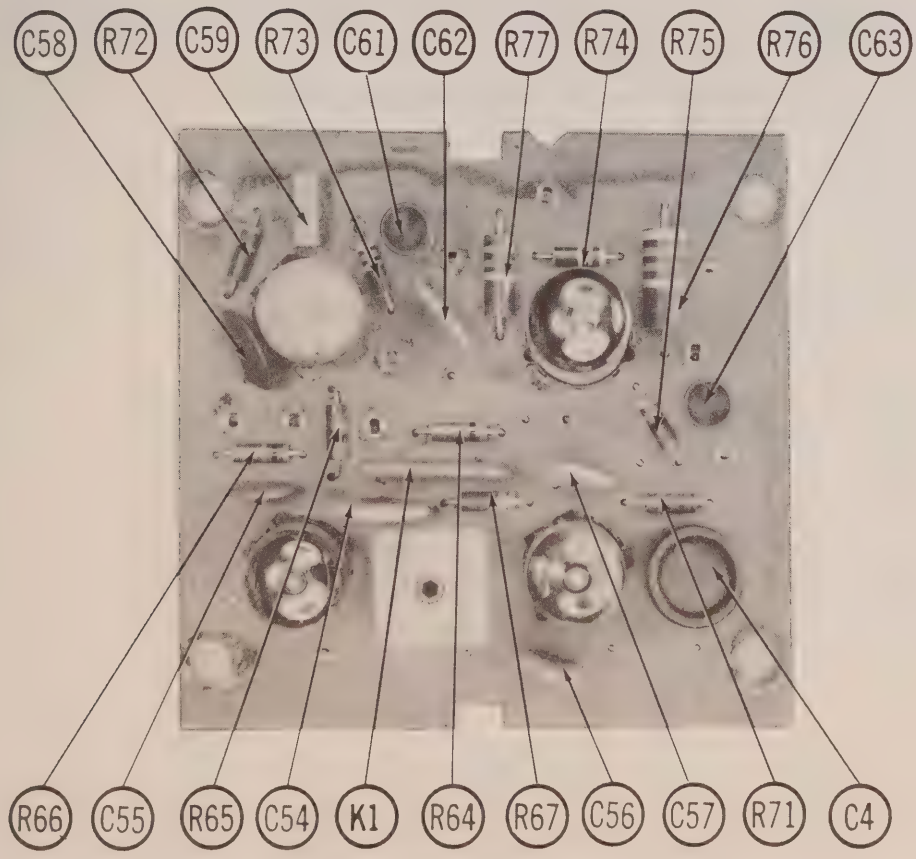


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C603 Series,
21G607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series,
24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)



CONTROL PANEL

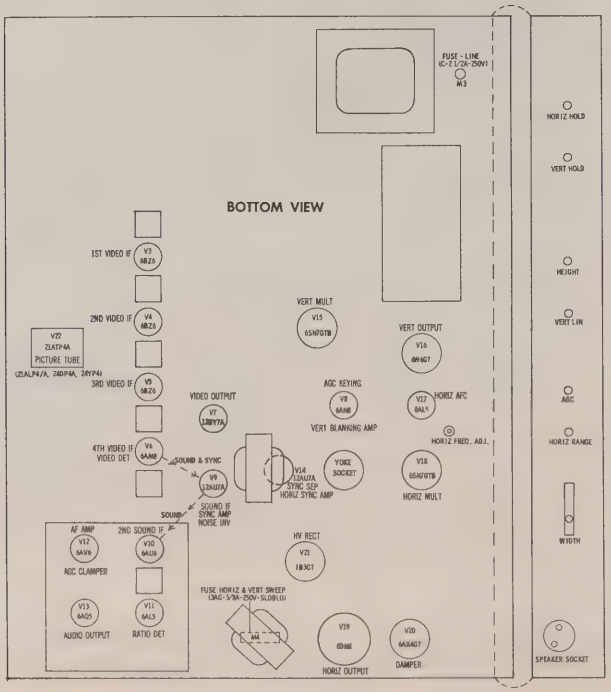


PRINTED BOARD

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	†23Ω	270K	INF	0Ω	.1Ω	INF	600K	0Ω	0Ω
V2	6BR8	10K	†560Ω	0Ω	.1Ω	0Ω	†1000Ω	†100K	0Ω	
V3	6BZ6	35K	47Ω	.1Ω	0Ω	†4800Ω	†11K	0Ω		
V4	6BZ6	34K	47Ω	.1Ω	0Ω	†4800Ω	†11K	0Ω		
V5	6BZ6	.1Ω	180Ω	.1Ω	0Ω	†3100Ω	†4100Ω	0Ω		
V6	6AM8	330Ω	.1Ω	†3300Ω	.1Ω	0Ω	†2600Ω	.1Ω	2700Ω	0Ω
V7	12BY7A	50Ω	2700Ω	0Ω	0Ω	0Ω	.1Ω	†3800Ω	†1900Ω	0Ω
V8	6AN8	‡800K	1Meg	56K	0Ω	.1Ω	†150K	†33K	220K	†10K
V9	12AU7A	†15K	12K	.4Ω	.1Ω	.1Ω	†40K	3.9Meg	3300Ω	0Ω
V10	6AU6	1.6Ω	0Ω	0Ω	.1Ω	†1000Ω	†11K	100Ω		
V11	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	22K		
V12	6AV6	15Meg	0Ω	0Ω	.1Ω	470K	0Ω	†470K		
V13	6AQ5	470K	270Ω	.1Ω	0Ω	†1000Ω	†500Ω	470K		
V14	12AU7A	†15K	2.4Meg	0Ω	0Ω	0Ω	†10K	1Meg	32Ω	.1Ω
V15	6SN7GTB	10K	†47K	1000Ω	●400K	‡680K	1000Ω	.1Ω	0Ω	
V16	6W6GT	NC	.1Ω	†480Ω	†580Ω	●1.8Meg	NC	0Ω	●300Ω	
V17	6AL5	100K	100K	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V18	6SN7GTB	9.5Meg	†7200Ω	820Ω	● 120K	†47K	820Ω	.1Ω	0Ω	
V19	6DN6	TP	.1Ω	0Ω	TP	330K	NC	0Ω	†10K	TOP CAP †30Ω
V20	6AX4GT	NC	TP	500K	NC	23Ω	TP	.1Ω	0Ω	
V21	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡480Ω
V22	21ATP4A	11K	290K	Pin 6 ‡120K	Pin 10 ‡800K	Pin 11 270K	Pin 12 11K			

† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V20.
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	6BQ7A	
V2	Mixer-Osc.	6BR8	
V3	1st Video IF Amplifier	6BZ6	
V4	2nd Video IF Amplifier	6BZ6	
V5	3rd Video IF Amplifier	6BZ6	
V6	4th Video IF Amplifier-Video Det.	6AM8	
V7	Video Output	12BY7A	
V8	AGC Keying-Vert. Blanking Amp.	6AN8	
V9	Sound IF Cathode Follower-Sync Amp. -Noise Inverter	12AU7A	
V10	Sound IF Amp.	6AU6	
V11	Ratio Detector	6AL5	
V12	AF Amp. -AGC Clamper	6AV6	
V13	Audio Output	6AQ5	
V14	Sync Sep. -Horiz. Sync. Cathode Follower	12AU7A	
V15	Vert. Mult.	6SN7GTB	
V16	Vert. Output	6W6GT	
V17	Horiz. AFC	6AL5	
V18	Horiz. Mult.	6SN7GTB	
V19	Horiz. Output	6DN6	
V20	Damper	6AX4GT	
V21	HV Rectifier	1B3GT	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	SYLVANIA PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V22	21ATP4/A	21ATP4 ①	21ATP4A/21ATP4①	21ATP4/A②	① Aluminized
	21ALP4A/B	21ALP4A ①	21ALP4B/A ①	21ALP4A/B ②	② Silver Screen "85"
		21ALP4B ①			
		21ALP4	21ALP4	21ALP4	
		21ATP4 ①	21ATP4A/21ATP4①	21ATP4/A②	
	24DP4A	24DP4A ①	24DP4A ①	24DP4A②	
		24DP4	24DP4	24DP4	
		24YP4 ①	24YP4 ①	24YP4 ②	
	24YP4	24YP4 ①	24YP4 ①	24YP4 ②	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	80	150	161-1023	RE1029	XA0265	FP138	TMS-47	S-225	TVL-1421
C2A	▲80	150	161-4019	AFHS4-98-70		FP453	TMQ-168	Q-282	TVL-4802.7
B	■20	350				TC65	TD-20-350		TVA-1608
C	▲60	350							
D	100	50							
C3A	▲200	350	161-3023	AFH3-111-85		FP332.4	TMT-165	Q-221.5	TVL-3636.8
B	▲50	25				TC29	TD-50-50	MTD-4510	
C	■10	350							
C4	2	50	161-1024	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301
C5	10	500	161-1022	PRS500V10	BR1250	TC82	TD-10-500	MT-5010	TVA-1963

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	800									
C7	47			BPD-000047	DD-470	C10Q47C	ED-47	UC-5447	5GA-Q47	
C8	8.2			NP0-SI 8.2		C10V82C	TCO-8.2			
C9	3			NP0-SI 3		C10V3C	TCO-3	ZT-553		
C10	3-8				829-10		532-B			
C11	800									
C12	800									
C13	.5-3				829-3		315-D	CT565A		
C14	.5-3				829-3		315-D	CT565A		
C15	60									
C16	800									
C17	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C18	5									
C19	68			N750-SI 68	TCN-68	C10Q68U	TC7-68		5TCU-Q68	
C20	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C21	10									
C22	5			NP0-SI 5	TCZ-5	L10V5	ED-5	ZT-555	5GA-V5	
C23	.5				TCZ-R5					
C24	800									
C25	150		166-0150N							Note 1
C26	30		166-0030		TCN-30	C10Q3U	TC7-30			Note 1
C27	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C28	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C29	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C30	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C31	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C32	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 3
C33	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 3
C34	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C35	.1	400	160-0601	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C36	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C37	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C38	270		166-0270N							
C39	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 3
C40	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 3
C41	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C42	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C43	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C44	43		166-0043P		TCN-43					
C45	270		166-0270N							
C46	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	Note 2
C47	10		166-0010P	BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C48	1000		166-1000D	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C49	10		166-0010P	NP0-SI 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	Note 1
C50	180		163-0180	1468-00018		5W5T18			MS-318	Note 4
C51	47		166-0047P	NP0-SI 47	TCZ-47	L10Q47	ED-47	UC-5447	5GA-Q47	
C52	.22	200	160-06022	P288N-22		CUB-2P22		GEM-2022	2TM-P22	
C53	47		166-0047P	NP0-SI 47	TCZ-47	L10Q47	ED-47	UC-5447	5GA-Q47	

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C605 Series, 21C607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series, 24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54A	4700		189-0033	BPD-2N0047	DD-472	BYCADD47	GP-4700	UC-5241	5HK-ED4T	
B	4700				DD-472		GP-4700	UC-5247		
C55	4700		189-0025	BPD-0047	DD-472	BYAADD4T	GP-4700	UC-5247	5HK-ED4T	
C56	1000		189-0028	BPD-001	DD-102	BYAED1	ED-1000	DC521	5HK-D1	
C57	1000		189-0024	BPD-001	DD-102	BYAED1	ED-1000	DC521	5HK-D1	
C58	10000		189-0026	BPD-01	DD-103	BYAED1	GP-10000	DC531	5HK-E1	
C59	.022	200	160-0512	BPD-22	DF-203	CUB2S22		GEM-2123	2TM-2123	
C60	100		189-0027	1488-0001		SWS71		MC335	MS-35	
C61	.0047	400	189-3034			BCS0472			5HK-D4T	
C62	.0000		189-0028	BPD-01	DD-103	BYAE61	GP-10000	DC531	5HK-S1	
C63	.0047	600	189-0034			BCSE0472			5HK-D4T	
C64	.1	200	160-0501	P388M-1		DF-104	CUB3P1	GEM-301	2TM-P1	
C65	.01	200	160-0502	BPD-01		CUB3S1		GEM-301	2TM-P1	
C66	.1	200	160-0501	P388M-1		DF-104	CUB3P1	GEM-301	2TM-P1	
C67	1.0	200	189-0018	P388M-L.0			CUB3W1	GEM-31	2TM -1	
C68	.001	200	160-0503	BPD-001		DD-103	BYAED1	ED-1000	DC521	Note 2
C69	.047	200	160-0547	BPD-05		DF-503	CUB3S47	GEM-3147	2TM-S47	Note 3
C70	.001		160-0501	BPD-001		DD-103	BYAED1	ED-1000	DC521	Note 2
C71	.001		160-0547	BPD-001		DD-103	BYAED1	ED-1000	DC521	5HK-D1	Note 3
C72	47		186-0047M	N750-81 47		TC4-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C73	.001	400	160-0401	BPD-001		DD-103	BYAE61		GEM-411	4TM-D1	
C74	.01	400	160-0501	BPD-01		DD-103	CUB4S1		GEM-411	4TM-S1	
C75	.01	200	160-0501	BPD-01		DD-103	CUB3S1		GEM-311	3TM-S1	
C76	120		163-0220	1488-U0022			SWS722		MS-322		
C77	22		168-0022	P388E-0022		DB-220	LU0Z2	ED-22	UC-5422	SCA-422	
C78	1000		189-0001	BPD-001		DD-102	BYAED1	ED-1000	DC521	5HK-D1	
C79	.022	400	160-0512	BPD-03		DF-303	CUB4S22		GEM-4123	4TM-S23	
C80	.01	200	160-0501	BPD-01		DD-103	CUB3S1		GEM-311	3TM-S1	
C81	.01	200	160-0501	BPD-01		DD-103	CUB3S1		GEM-311	3TM-S1	
C82	.001	200	160-0501	BPD-001		DD-102	CUB3D1		GEM-311	3TM-D1	
C83	.001	400	160-0501	BPD-001		DD-102	CUB4D1		GEM-421	4TM-D1	
C84	.022	200	160-0512	BPD-02		DF-203	CUB3S22		GEM-3123	3TM-S23	
C85	.01	400	160-0501	BPD-01		DD-103	CUB4S1		GEM-411	4TM-S1	
C86	..	600	160-0601	P688K-1		DF-104	CUB6P1		GEM-601	6TM-P1	
C87	.01	200	160-0501	BPD-01		DD-103	CUB3S1		GEM-311	3TM-S1	
C88	.22	400	160-0602	P488K-22			CUB4P22		GEM-4023	4TM-P23	
C89	.0001	500	189-0033	BVD-30-1000		DD30-101	BYB5D1		DC501	5HK-D1	
C90	.0047	200	160-0247	BPD-0047		DF-473	CUB2D47		GEM-2247	2TM-D47	
C91	.1	400	160-0611	BPD-01		DD-103	CUB4S1		GEM-411	4TM-S1	
C92	.001	500	189-0033	BVD-30-1000		DD30-101	BYB5D1	ED-1000	DC521	5HK-D1	
C93	.001		166-0001	BPD-001		DD-102	BYAED1	ED-1000	DC521	5HK-D1	
C94	.022	200	160-0512	BPD-02		DF-203	CUB2S22		GEM-2223	2TM-S23	
C95	.022	200	160-0512	BPD-03		DF-303	CUB3S22		GEM-3123	3TM-S23	
C96	470		163-0470	1487-0004T			SWS747			5HK-S47	
C97	.047	200	160-0247	BPD-0047		DD-473	CUB2S47		GEM-2247	2TM-S47	
C98	.001	400	160-0621	BPD-001		DD-102	CUB4D1		GEM-421	4TM-D1	
C99	680		163-0681	1487-0068			SWS768			MS-368	
C100	.1	300	160-0601	P288K-1		DF-104	CUB2P1		GEM-301	2TM-P1	
C101	.047	400	160-0647	BPD-05		DF-503	CUB4S47		GEM-4147	4TM-S47	
C102	.001	400	160-0621	BPD-001		DD-102	CUB4D1		GEM-421	4TM-D1	Note 5
C103	047	600	160-0647	BPD-05		DF-503	CUB6S47		GEM-6147	6TM-D47	
C104	.001	500	189-0040	P288M-001		DD-103	CUB5D1		GEM-5021	10TM-D1	Note 1
C105	.1	1000	189-0035				CUB10P1		GEM-1001	10TM-P1	Note 1
C106	.1	300	189-0035				CUB10P1		GEM-1001	10TM-P1	
C107	.01	200	160-0501	BPD-01		DD-103	CUB2S1		GEM-211	2TM-S1	Note 6
C108	1000		166-0002D	BPD-001		DD-102	BYAED1	ED-1000	DC521	5HK-D1	Note 2
C109	1000		166-0002D	BPD-001		DD-102	BYAED1	ED-1000	DC521	5HK-D1	Note 2
C110	1000		166-0002D	BPD-001		DD-102	BYAED1	ED-1000	DC521	5HK-D1	

Note 1: Not used in chassis 1-533-3, -4.
Note 2: In chassis 1-533-7, -8, a 4700MMF is used in this application. (Part #168-4700D)
Note 3: In chassis 1-533-7, -8, a dual 4700MMF is used in this application. (Part #182-001LD)
Note 4: Some reworks may use 4700MMF mica in this application. Part #183-0047.
Note 5: Not used in some versions.
Note 6: Some versions may use an .047MFD in this application. Part #160-0147)

CONTROLS

ITEM No.	RATING RESIST ANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	157-0047		A47P1-250K	Q13-130X	UT425	Volume-Trap ① 100K - Note 1
B	Shaft	½			KSS-5	C3 ②	DS-36 ① U-55	Tone - Note 2
R2A	5.5Meg	½	152-0036				DS-36 ①	
B	Coupler	½					U-56 ①	
R3A	Meg	½	153-0083	A2-69	A47-1Meg-S	Q11-137	U84	Brightness - Note 1
B	Shaft	½		AK-4	KSS-6	C3 ②	DS-36 ① U92R ①	Contrast - Note 3
R4A	500Ω	½	153-0084	AB-415				
B	Shaft	½		AK-4			Not Req.	Horiz. Hold - Note 4
R5A	50K	½	153-0089	AB-51	A47-50K-S	B11-123	PTA54L	
B	Shaft	½		AK-4		TM3-KT	Not Req.	
R6A	1Meg	½	153-0080	AB-69	A47-1Meg-S	B11-137	TA16L	Vertical Hold - Note 5
B	Shaft	½		AK-4	KSS-3	TM3-KT	Not Req.	
R7A	.5 Meg	½	153-0070	AB-742	A47-.5Meg-S	Q11-138	TA15SL	Height
B	Shaft	½		AK-1	FKS-1/2	RQ	Not Req.	
R8A	1500Ω	3	153-0071	WR-130	WP3L500	B11-139	RU500	Vert. Linearity (Wire-wound)
B	Shaft			Not Req.	KSS-3		Not Req.	
R9A	5.000Ω	½	153-0081	AB-50	A47-5000-S	B11-124	TA53L	AGC - Note 6
B	Shaft	½		AK-4	KSS-3	TM1-KT	Not Req.	
R10A	150K	½	153-0007	AB-50	A47-250K-S	Q11-130	SU-48	Horiz. Range
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

Note 1: In chassis 1-533-3, -4, R1A and R3A are a part of a dual control. (Part #157-0044)
Note 2: Alternate part #153-0086 used in chassis 1-533-5, -6.
Note 3: Alternate part #153-0088 used in chassis 1-533-5, -6.
Note 4: Alternate part #153-0079 used in chassis 1-533-5, -6.
Note 5: Alternate part #153-0078 used in chassis 1-533-5, -6.
Note 6: A 25K, ½W control part #153-0041 is used in chassis 1-533-3, -4.
† Use shaft of original control and coupler.
‡ Extension shaft instead of coupler. Use with replacement control shaft.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R1	680K		181-0684	BTS-680K	
R2	47K		181-0473	BTS-47K	
R3	560K		181-0564	BTS-560K	
R4	470K		181-0474	BTS-470K	
R5	6800Ω		181-0682	BTS-6800	
R6	220K		181-0224	BTS-220K	
R7	10K		183-0103	BTS-10K	
R8	100K		181-0104	BTS-100K	
R9	1000Ω		181-0102	BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R20	22K		181-0223	BTS-22K	
R21	47000Ω		181-0472	BTS-470Ω	
R22	10K		183-0103	BTS-10K	
R23	47K		181-0473	BTS-47K	
R24	47K		181-0473	BTS-47K	
R25	390K 5%		181-03945	BTS-390K 5%	
R26	1000Ω		181-0102	BTS-1000	
R27	120K 5%		181-01245	BTS-120K 5%	
R28	1000Ω		181-0102	BTS-1000	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R29	1800Ω 5%		181-0185		
R30	10K		181-0103	BTS-10K	
R31	470 5%		181-04705	BTS-47 5%	
R32	1500Ω		181-0152	BTS-1500	
R33	33K 5%		181-03335	BTS-33K 5%	
R34	1000Ω		181-0103	BTS-1000	
R35	2700Ω		181-0272	BTS-2700	
R36	180Ω		181-0181	BTS-1500	
R37	10K		181-0103	BTS-10K	
R38	470 5%		181-04705	BTS-47 5%	
R39	3300Ω	5	187-0033	PWT-3300	
R40	1500Ω		181-0152	BTS-1500	
R41	1000Ω		181-0102	BTS-1000	
R42	1000Ω		181-0102	BTS-1000	
R43	180Ω		181-0181	BTS-180	
R44	1200Ω		181-0122	BTS-1200	
R45	33K		181-0223	BTS-22K	
R46	680Ω		181-0681	BTS-680	
R47	680Ω		181-0681	BTS-680	
R48	330Ω		181-0331	BTS-330	
R49	15K		181-0153	BTS-15K	
R50	33K		181-0333	BTS-33K	
R51	2700Ω		181-0272	BTS-2700	
R52	10K		181-0103		Note 1
R53	33K		181-0333	BTS-33K	
R54	330K		181-0334	BTS-330K	
R55	1Meg		181-0105	BTS-1Meg	
R56	10K 5%	3	183-0035	BTR-10K 5%	
R57	12K 5%	2	183-0235	BTR-12K 5%	
R58	12K 5%	2	183-0235	BTR-12K 5%	
R59	220K		181-0224	BTS-220K	
R60	33K		181-0333	BTS-33K	
R61	1K	3	183-0235	BTR-1K	
R62	33K		181-0333	BTS-33K	
R63	22K		181-0223	BTS-22K	
R64	100Ω		181-0101	BTS-100	
R65	1000Ω		181-0102	BTS-1000	
R66	22K		181-0223	BTS-22K	
R67	330Ω		181-0331	BTS-330	
R68	1Meg		181-0105	BTS-1Meg	
R69	1Meg		181-04755	BTS-4.7Meg 5%	
R70	4.7Meg 5%		181-04755	BTS-4.7Meg 5%	
R71	22K		181-0223	BTS-22K	
R72	15Meg 5%		181-0156	BTS-15Meg 5%	
R73	470K		181-0474	BTS-470K	
R74	470K		181-0474	BTS-470K	
R75	47Ω		181-0470	BTS-47	
R76	470Ω	2	183-0471	BTR-470	
R77	270Ω	1	183-0271	BTA-270	
R78	470Ω	2	183-0471	BTR-470	
R79	2200Ω	1	183-0222	BTA-2200	
R80	33K		181-0333	BTS-33K	
R81	1Meg		181-0105	BTS-1Meg	
R82	470K		181-0474	BTS-470K	
R83	33K 5%	2	183-03335	BTR-33K 5%	
R84	3300Ω		181-0332	BTS-3300	
R85	100K		181-0104	BTS-100K	
R86	220K		181-0224	BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	NOTES
R87	220K		181-0224	BTS-220K	
R88	2.2Meg		181-0225	BTS-2.2Meg	
R89	33K		181-0333	BTS-33K	
R90	15K		181-0153	BTS-15K	
R91	22K		181-0223	BTS-22K	
R92	150K		181-0154	BTS-150K	
R93	10K		181-0103	BTS-10K	
R94	47K		181-0473	BTS-47K	
R95	1000Ω		181-0102	BTS-1000	
R96	390K		181-0394	BTS-390K	
R97	3.3Meg		181-0335	BTS-3.3Meg	
R98	560K		181-0564	BTS-560K	
R99	39000 5%		181-03925	BTS-3900 5%	
R100	100Ω		181-0101	BTS-100	
R101	180Ω	1	183-0181	BTA-180	
R102	820K		181-0824	BTS-820K	
R103	220K		181-0224	BTS-220K	
R104	680K		181-0684	BTS-680K	
R105	390K	1	182-0394	BTA-390K	
R106	120K	1	182-0124	BTA-120K	
R107	56K		181-0563	BTS-56K	
R108	2200Ω		181-0222		
R109	2200Ω		181-0222		
R110	1Meg		181-0105		
R111	10K	2	183-0093		
R112	100K		181-0104		
R113	33K		181-0393		
R114	100K		181-0104		
R115	100K		181-0104		
R116	4.7Meg		181-0475		
R117	4.7Meg		181-0475		
R118	6800Ω	1	182-0682		
R119	56K		181-0563		
R120	820Ω		181-0821		
R121	33K		181-0333		
R122	47K		181-0473		
R123	330K		181-0334		Note 2
R124	6800Ω		181-0682		
R125	270Ω		181-0271		
R126	330K		181-0334		
R127	270K		181-0274		
R128	220Ω		181-0221		
R129	330Ω		181-0221		
R130	22K	2	183-0223	BTR-22K	Note 3
R131	18K	2	183-0183	BTR-18K	Note 4
R132	33000Ω		187-0033	PWW-3300	
R133	1Ω		187-0047		Note 5
R134	4700Ω		181-0472	BTA-15	
R135	15Ω	1	183-0150	BTR-33K	
R136	33K	2	183-0238	BTR-33K	
R137	33K	2	183-0238	BTR-33K	
R138	100K	3	183-0049	BTR-100K	
R139	150K	3	183-0054	BTR-150K	
R140	12K 5%	2	183-0123	BTR-12K 5%	Note 6
R141	12K 5%	2	183-0123	BTR-12K 5%	Note 7
R142	10K 5%	2	183-0103	BTR-10K 5%	Note 7
R143	4.7Ω	15	187-0034	ZD-5	
R144	470K		181-0474	BTS-470K	

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	Halloran PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .8A	6.3V @ .6A	6.3V @1.7A		141-0084		P-3043①			F-30A①

① Type SV winding.
② Parallel & phase 6.3V, 5A windings.

TRANSFORMER (HALOLIGHT)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA SYLVANIA PART No	Halloran PART No	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No
T3	117VAC	689V			141-0065 ①					
	@ .1A				141-0068 ②					

① 21" Models.
② 24" Models.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	SYLVANIA PART No	Halloran PART No	Merit PART No	RCA TYPE No	Rem PART No	Stancor PART No	Thordarson PART No	Triad PART No.
T3	Horiz. Output Trans.	241-0041 ①	FB419*-5 ③	HVO-54*5	236T1 & 234M1*5	X159*-X ③	A-8255*1 ③	FLY-78*4 ③	D-49*1 ③
		241-0037 ②	FB419*-5 ③	HVO-54*5	236T1 & 234M1*5	X159*-1 ③	A-8255*1 ③	FLY-76*4 ③	D-49*1 ③
T4	Vert. Output Trans.	241-0034	Z1900 ③	A-2822 ③	233D1 ③	V314 ③	A-8147 ③	28878 ③	A-116X
T5A	Yoke(90°Horiz)(24M1)	190-0025	DY-907 ③	MDY-92 ③		DY-91A ③	DY-18-B ③	Y-41-1 ③	Y-41-2 ③
B	Vert(45M1)	190-0029 ③				20LR15A ③	WC-7 ③	WC-23 ③	WC-13 ③
T6	Width Coil (5-5.5M2H)	132-0011 ③ 132-0013 ③	RF803 ③	MWC-2 ③					

① Used in chassis 1-533-7, -8, -9 Codes 01 & 04.
② Used in chassis 1-533-3, -4 & codes 00, 02 & 03 of chassis 1-533-7, -8, -9.
③ Drill new mounting hole(s).
④ Connect as auto transformer.
⑤ Use 6 to 1 turns ratio.
⑥ Used in 24" model of chassis 1-533-7, -8, -9.
⑦ Use original core clamp and associated components.
⑧ Connect horiz. yoke term #3 to yoke plug pin #1; horiz. yoke term #1 to yoke plug pin #3.
⑨ Connect horiz. damping network across yoke terms #3 and #7.
⑩ Use network #3 (WW).
⑪ Used in chassis 1-533-7, -8, -9.
⑫ Used in chassis 1-533-3, -4.
⑬ Drill new mounting hole or use original slider, clip and core.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	9	5	9	5	5	5	5
	6	7	6	7	4	4	6	6
	2	7	4	7	4	4	6	6
	1	2	1	Term "D" of 214M1	2	7	7	3
	9	8	7	Term "E" of 214M1	8	8	8	4
	8	7	8	Term "A" & "B" of 214M1 across 6 & 1	7	2	8	4
Damper Width Coil Assembly								
Special Notes		⑭	⑮⑯	⑰	⑭	⑭	⑭	⑭

⑭ Requires 2 turns on filament winding.
⑮ Remove original width coil, and resistor R132.
⑯ If picture is out of phase, reverse width coil primary or secondary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC	REPLACEMENT DATA SYLVANIA Part No.	Halldorson Part No	Merit Part No.	Stancor Part No	Thordarson Part No	Triad Part No	NOTES
T7	6.5K	3-4Ω	143-0046	Z1007	A-3020	A-3823	28848	S-53X	

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V C IMP	REPLACEMENT DATA SYLVANIA PART No.	CALAM PART No.	NOTES
SP1	4" X 6" S 3/4" 8"	PM	3-4Ω	539-4602 ①	46A07	① Used in models 21T301, 24T301, 21T303.
		PM	3-4Ω	539-0576 ②	52A1	② Used in models 21T201, 21T206.
		PM	3-4Ω	539-0606 ② ③		③ Used in models 21C605, 21C607, 24C603, 21C501, 21C502.
	6"	PM	3-4Ω	539-0409 ④ ⑤		④ Used in models 21C605, 21C607, 24C603, 21C502.
						⑤ 8" and 6" speakers used in models 21C605, 21C607, 24C605, 21C502 have color dots for proper speaker phasing.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	47.25MC Sound Trap	118-0030				Note 1
L2	1st Video IF	119-0011				Includes 39.75MC Trap.
L3	2nd Video IF	118-0003	17-5002	TV-127	6232	Includes 41.25MC Trap.
L4	Fil. Choke	147-0014	19-3301	TV-129	6175	.7 Microhenries
L5	3rd Video IF	119-0004	17-5003	TV-128	6233	
L6	4th Video IF	119-0005	17-5003*	TV-127*	6233*	Includes 47.25MC Trap.
L7	Fil. Choke	147-0014	19-3301	TV-129	6175	.7 Microhenries
L8	4.5MC Trap	118-0011	20-1045			
L9	5th Video IF	119-0006	17-5004	TV-125	6234	
L10	Series Peaking Coil	118-0030	19-1001		4604	L 5 Microhenries
L11	Shunt Peaking Coil	112-0014				39 Microhenries; Note 1
L12	Shunt Peaking Coil	131-3028	19-3160 A		6130 A	148 Microhenries; Wound on 57K resistor.
L13	4.5MC Trap	118-0033	20-1046	TV-151	1689	
L14	Series Peaking Coil	146-0016			4626	28.8 Microhenries; Note 1
L15	Series Peaking Coil	131-3024	19-3100	TV-151	6177	99 Microhenries
L16	Shunt Peaking Coil	131-3018				Variable-to① 270 Microhenries
L17	1st Sound IF	130-0003				Tapped② 4Ω
L18	Ratio Det.	133-0013				Tertiary Winding = 1Ω
L19	RF Choke	147-0014	19-3301	TV-129	6175	Note 1
L20	RF Choke	118-0010	19-1006		4612	9.6 Microhenries
L21	RF Choke	118-0010	19-1005		4613	9.6 Microhenries
L22	RF Choke	118-0010	19-1005		4613	9.6 Microhenries
L23	Line Choke	145-0031				15 Microhenries

* Detune trap and drill mounting holes.
▲ Parallel with 27K resistor.
Note 1: Not used in chassis 1-533-3, -4.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	SEC	SYLVANIA PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No.	Rem PART No	Thordarson PART No	NOTES
L24	32Ω	32Ω	243-0001							
L25	10Ω		132-0001	19-1576*	TV-163*	6210*			H5-5	

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE IO CURRENT (000 ^Ω)	REPLACEMENT DATA SYLVANIA PART No.	Halloran PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26	.380A	23Ω	.62H	145-0019	C5041 ①		C-2338 ①		

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	De-emphasis	22K, 10000MMF, 4000MMF, 10000MMF	190-0023	Aerovox PA-355 Centralab PC-186

SYLVANIA MODELS 21C501 Series, 21C502 Series, 21C605 Series, 21C607 Series, 21T201 Series, 21T206 Series, 21T301 Series, 21T303 Series, 24C603 Series, 24T301 Series (Ch. 1-533-3, -4, -7, -8, -9)

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						
	CURRENT (Measured)	SYLVANIA PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.380A	517-0010 ①	1179A ①	1N1013 ②	RS450SL ①	6S450 ①	6S2 ①	500 ①
M2	.380A	517-0010 ①	1179A ①	1N1013 ②	RS450SL ①	6S450 ①	6S2 ①	500 ①

① Selenium type.
② Germanium type. Voltage doubler (Connect in parallel)

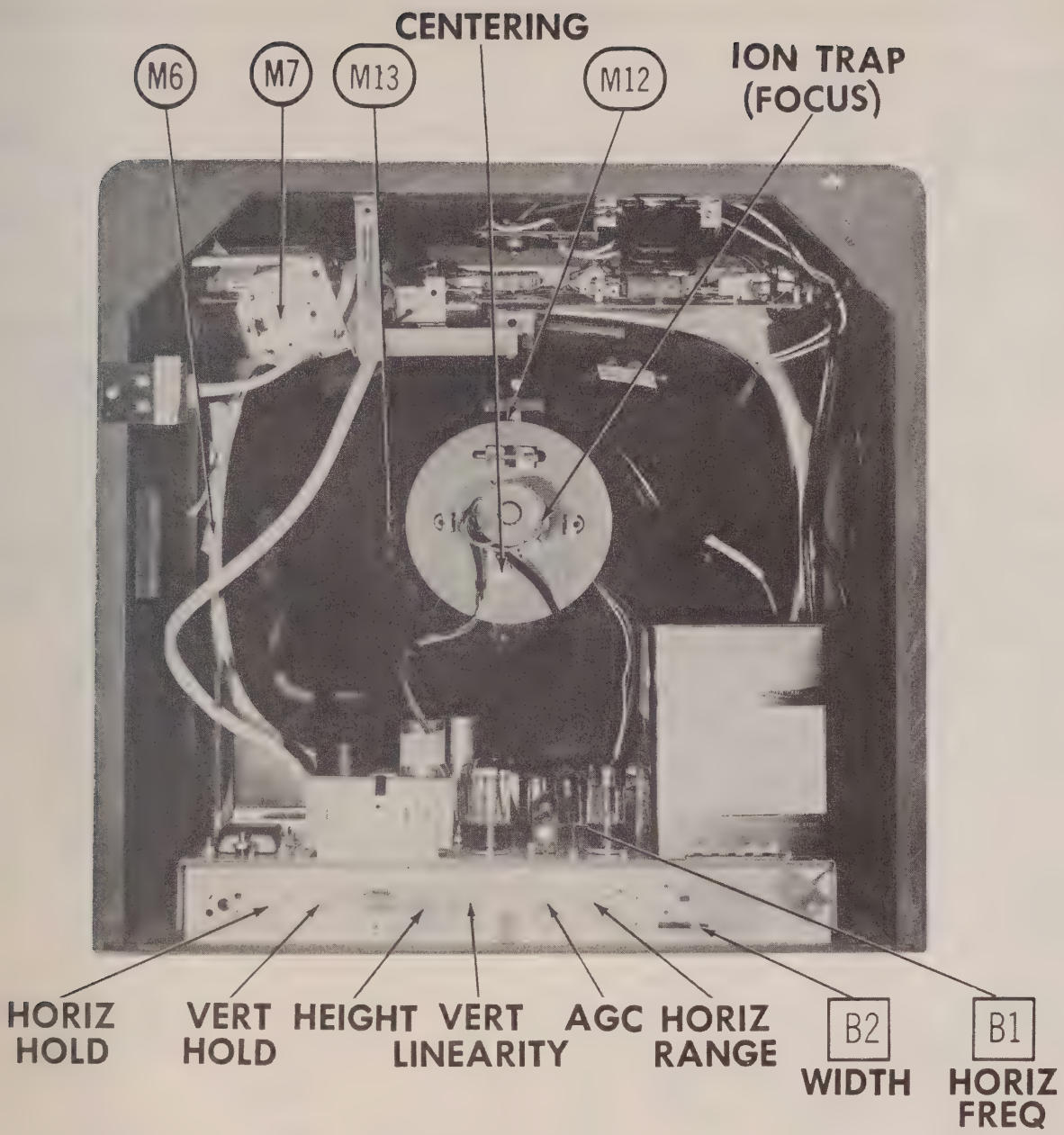
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	C	2½A 250V	191-0022	562-0011	33202.5 (C-2½A)	346006	C 2½	HC 1 3/4-2½
M4	3AG S/B	3/8A 250V	191-0024 Note 1	487-0008	313.375 (3AG-S/B-3/8A)	357001	MDL 3/8	4405
M5	2" length of #26 wire							

Note 1: A 1/4A fuse part #191-0023 used in early production of chassis 1-533-3, -4.

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M6	Halolight	611-2104	Used in 21" Models.
	Halolight	611-2402	Used in 24" Models.
M7	Tuner	323-0076	VHF, Used in chassis 1-533-7, -8, -9. VHF Models.
	Tuner	323-0087	Alternate VHF, Used in chassis 1-533-9 only. VHF Models.
	Tuner	323-0077	VHF, Used in chassis 1-533-7, -8, -9. UHF Models.
	Tuner	323-0078	UHF, Used in chassis 1-533-7, -8, -9. UHF Models.
	Tuner	323-0069	VHF, Used in chassis 1-533-3, -4.
	Tuner	323-0068	UHF, Used in chassis 1-533-3, -4.
M8	Switch	571-0014	On-Off. Used in chassis 1-533-7, -8, -9.
M9	Switch	573-0011	Halolight Dimmer, 21" Models.
	Switch	573-0012	Halolight Dimmer, 24" Models.
M10	Centering Device	400-0025	
M11	Ion Trap	400-0027	
M12	Correction Magnet		
M13	Correction Magnet		
	Switch	571-0018	On-Off Remote.
	Switch	571-0016	Power Tuning, SPDT
	Switch	571-0017	Power Tuning Remote, SPDT
	Motor	924-0006	Remote Control. Includes gear box ass'y., chassis 1-533-9 only.
	Yoke Clamp	487-0044	
	Terminal Board	480-0012	Halolight. Models 21T303, 21C607.
	Glass	710-0029	Used in models 21T303, 21C605, 21C607.
	Glass	710-0018	Used in models 21T201, 21C501, 21T206
	Glass	710-0024	Used in models 21T301, 21C502.
	Glass	710-0020	Used in model 24T301.
	Glass	710-0030	Used in model 24C603.
	Mask	716-0029	Used in models 21T303, 21C605, 21C607.
	Mask	716-0024	Used in models 21T201, 21T301, 21C501, 21C502, 21T206
	Mask	716-0025	Used in model 24T301.
	Mask	716-0030	Used in model 24C603.
	Knob	740-0116	Brightness, Contrast, Fine Tuning-UHF Tuning, Tone, Volume, Models 21T303, -C605, -C607, 24C603.
	Knob	740-0117	On-Off, Channel Selector, Models 21T303, -C605, -C607, 24C603.
	Knob	740-0130	On-Off, Channel Selector, Models 21C605, -C607, 24C603, Power Tuning Models Only.
	Knob	744-0025	Halolight, Models 21T303, -C605, -C607, 24C603.
	Knob	744-0041	Brightness, Models 21T201, -T301, -C501, -C502, 24T301, 21T206
	Knob	748-0005	Dummy, Models 21T201, -T301, -C501, -C502, 24T301. 21T206
	Knob	744-0036	Contrast, Tone, (Blond) Models 21T201, -C501.
	Knob	744-0030	Contrast, Tone, (Blond) Models 21T301, -C502, 24T301.
	Knob	744-0035	Contrast, Tone, (Mahogany) Models 21T201, -C501, 21T206
	Knob	744-0030	Contrast, Tone, (Mahogany) Models 21T301, -C502, 24T301.
	Knob	741-0024	Fine Tuning (VHF Models) Models 21T201, -T301, -C501, -C502, 24T301, 21T206
	Knob	741-0025	Fine Tuning/UHF Channel Selector (UHF Models)-Models 21T201, -T301, -C501, -C502, 24T301, 21T206
	Knob	744-0040	On-Off, Volume, Models 21T201, -T301, -C501, -C502, 24T301. 21T206
	Knob	744-0025	Halolight, Models 21T301, -C502, 24T301.
	Case	822-0017	Remote Unit (Bottom)
	Case	822-0016	Remote Unit (Top)



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

AGC must be adjusted before proceeding with the following.
Use isolation transformer.
Turn the set on and tune in a TV station.
Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.
To adjust the horizontal AFC circuit, proceed as follows:

1. Short pin 8 (cathode) of the 12AU7A (V14), horizontal sync cathode follower, to chassis with a clip lead.

2. Connect a clip lead across the horizontal frequency coil (L25).

3. Set the horizontal hold control (R5) to the center of its range.

4. Adjust the horizontal range control (R10) until the picture floats back and forth across the screen with the blanking bar vertical.

5. Remove the clip lead from L25 and adjust the horizontal frequency slug (B1) until the picture again moves back and forth across the screen with the blanking bar vertical.

6. Set the contrast control fully counter clockwise and turn the horizontal hold control for best lock-in action.

7. Set the contrast control for normal picture and check for proper lock-in action on all available channels. If necessary, SLIGHTLY readjust the horizontal hold control.

ALTERNATE HORIZONTAL AFC ADJUSTMENT

1. Tune in the strongest channel in area.

2. Adjust width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

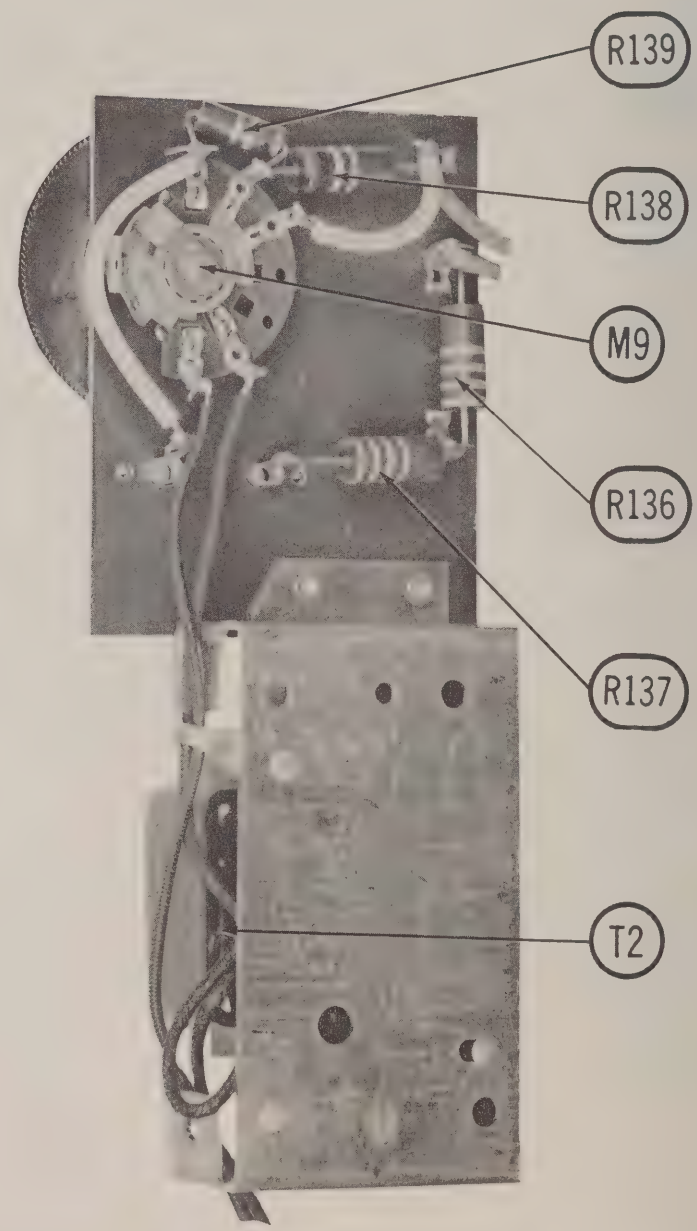
3. Remove the 6AL5 (V17), horizontal AFC.

4. Set the horizontal hold control (R5) to mid-range.

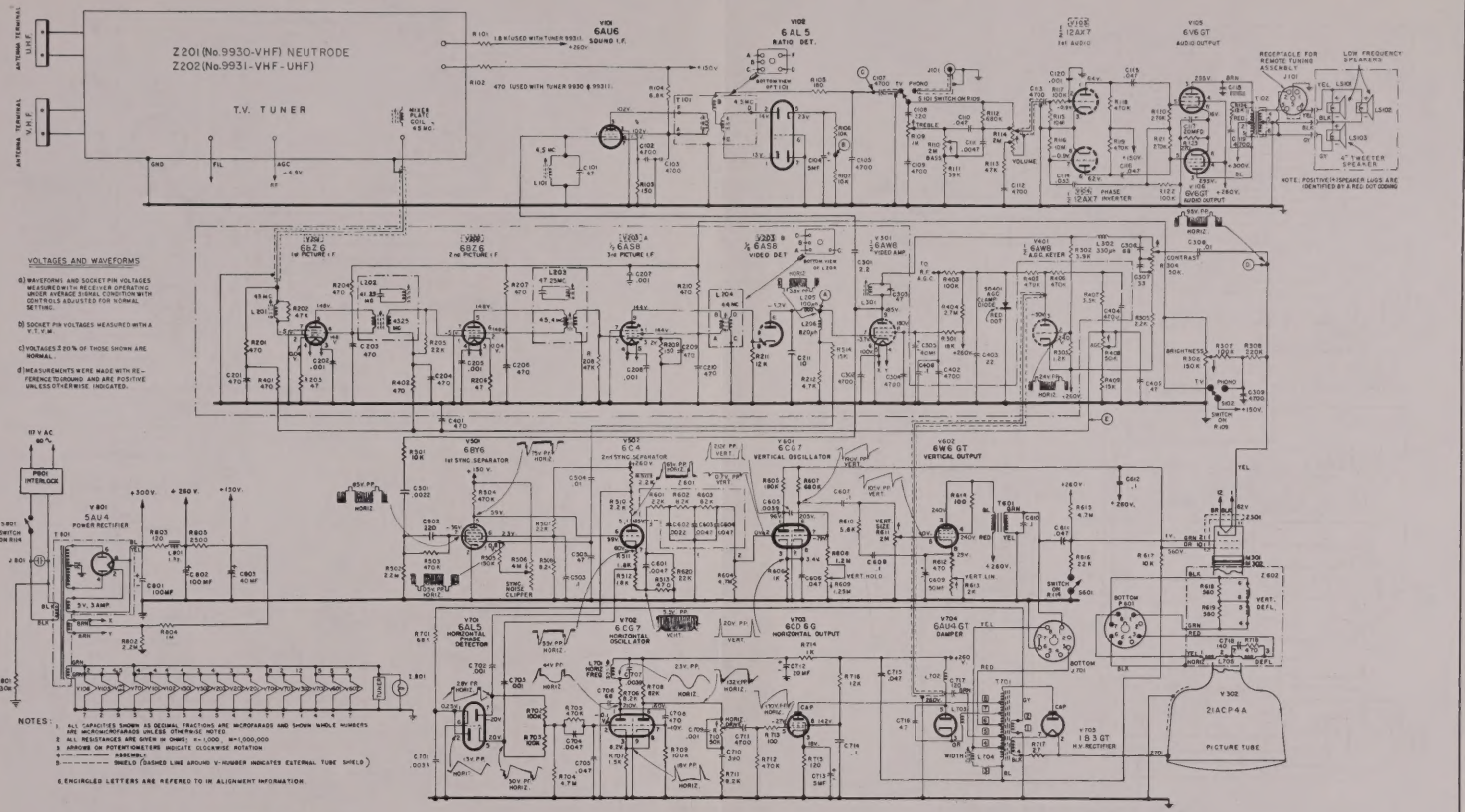
5. Adjust the horizontal range control (R10) until the picture moves back and forth across the screen with the blanking bar vertical.

6. Replace 6AL5 (V17).

7. Switch off channel and back again. If picture fails to sync, SLIGHTLY readjust the horizontal hold control and repeat this step.



HALOLIGHT CONTROL BOARD


Z201 (No. 9930-VHF) NEUTRODE
Z202 (No. 9931-VHF-UHF)
T.V. TUNER
VOLTAGES AND WAVEFORMS
a) WAVEFORMS AND SOCKET PIN VOLTAGES MEASURED WITH RECEIVER OPERATING UNDER AVERAGE SIGNAL CONDITION WITH CONTROLS ADJUSTED FOR NORMAL SETTING.
b) SOCKET PIN VOLTAGES MEASURED WITH A V.T.V.M.
c) VOLTAGES ± 20 % OF THOSE SHOWN ARE NORMAL.
d) MEASUREMENTS WERE MADE WITH REFERENCE TO GROUND AND ARE POSITIVE UNLESS OTHERWISE INDICATED.
NOTES:
1 ALL CAPACITIES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS AND SHOWN WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
2 ALL RESISTANCES ARE GIVEN IN OHMS: K=1,000 M=1,000,000
3 ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION
4 ——— ASSEMBLY
5 - - - - - - SHIELD (DASHED LINE AROUND V-NUMBER INDICATES EXTERNAL TUBE SHIELD)
6. ENCIRCLED LETTERS ARE REFERED TO IN ALIGNMENT INFORMATION.
V101 6AU6 SOUND I.F.
V102 6AL5 RATIO DET.
V103 6BZ6 1st PICTURE I.F.
V104 6BZ6 2nd PICTURE I.F.
V105 A ½ 6AS8 3rd PICTURE I.F.
V105 B ½ 6AS8 VIDEO DET
V106 6AWB VIDEO AMP
V107 6AWB A.G.C. KEYER
V108 12AX7 1st AUDIO
V109 6V6GT AUDIO OUTPUT
V201 5AU4 POWER RECTIFIER
V501 6BY6 1st SYNC SEPARATOR
V502 6C4 2nd SYNC SEPARATOR
V503 6CG7 VERTICAL OSCILLATOR
V504 6W6 GT VERTICAL OUTPUT
V601 6AL5 HORIZONTAL PHASE DETECTOR
V602 6CG7 HORIZONTAL OSCILLATOR
V603 6CD6G HORIZONTAL OUTPUT
V604 6AU4GT DAMPER
V605 1B3GT H.V. RECTIFIER
V302 21ACP4A PICTURE TUBE
RECEPTACLE FOR REMOTE TUNING ASSEMBLY J101
LOW FREQUENCY SPEAKERS
4" TWEETER SPEAKER
NOTE: POSITIVE (+) SPEAKER LUGS ARE IDENTIFIED BY A RED DOT CODING
117 V AC 60 ~
P801 INTERLOCK
S801 SWITCH ON R114
J 801
+300 V.
+ 260 V.
+150 V.
R801 330K
R802 2.2M
R803 150
R804 1M
R805 2500
C801 100MF
C802 100 MF
C803 40 MF
3 V., 3 AMP
BRIGHTNESS R307 250K
CONTRAST R304 50K
HORIZ. R308 330K
VERT. HOLD R408 1M
VERT. LIN. R411 2K
VERT. SIZE R411 2M
HORIZ. PHASE R613 2K
HORIZ. OSC. FREQ. R703 100K
WIDTH L704
VERT. DEFL.
HORIZ. DEFL.
SWITCH ON R114
S601

HOFFMAN

MODEL	CHASSIS
B3191, U	420, U
M3181, U	420, U
SP3181, U	420, U

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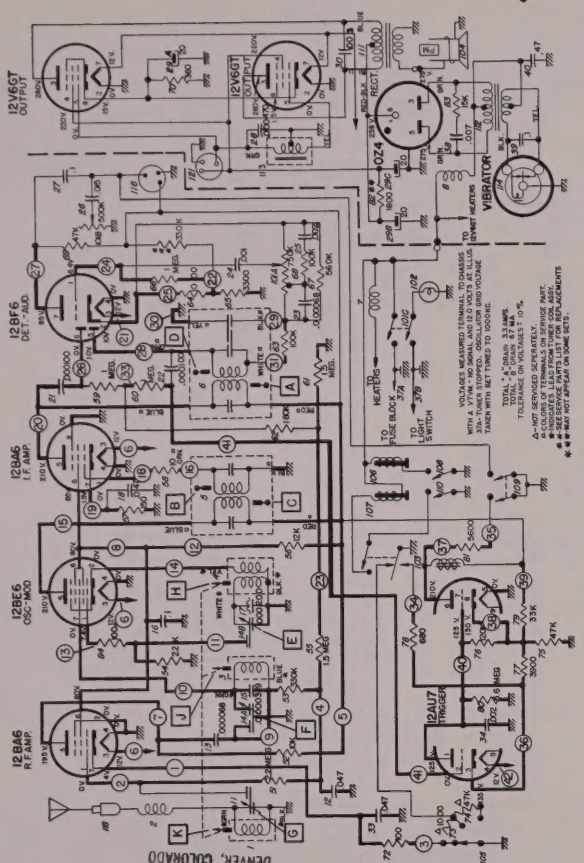
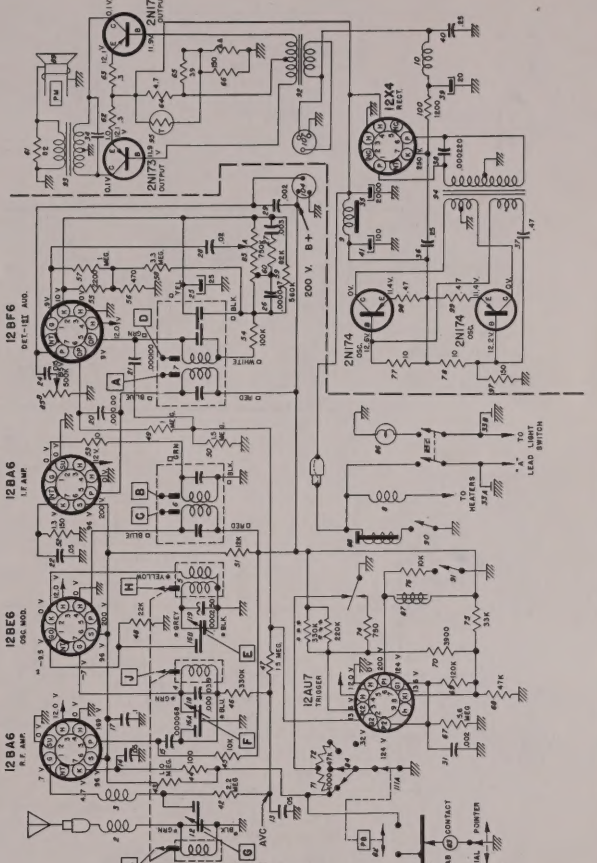


CHEVROLET
MODEL
987577



CHEVROLET
MODEL
3725156

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